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Special Contributions.

The Ivy.

FROM childhood I have loved the ivy. Looking back through a vista of almost twenty-five years, I see, as if a scene of yesterday, an old farm-house in the earliest settled portion of Pennsylvania; an old old house, whose grey stones were ivy clad; whose mossy roof was ivy covered; whose rugged chimneys were ivy capped. Each quaint window peeped forth from dense masses of ivy, and the gambrel roofed porches seemed hidden amid the ivy garlands. The vine from which this mass of verdure was produced was at its base nine inches in circumference, and must have been planted at a very early day. It was (of course) perfectly hardy, and grew with such vigor, that each spring the pruning knife or shears was used ruthlessly in order to admit light and air through windows and doors. Reaching the roof and chimney tops, it spread forth yards of "fruiting branches," which were covered with clusters of rich purple berries. From comparison with various descriptions and from personal examination, I have concluded that this old plant was an English Ivy, "Hedera Helix." Mr. Shirley Hibberd thus describes this variety.

"*The handsomest and most hardy of the colored species. Grows very free and robust; the young leaves are of a light, bright grass green, the older ones, large, dark green and with whitish veins; in winter shaded with chocolate color, and very glossy.*"

During the later portion of my life I resided in another of the old American homes, situated in Delaware, and here was another ancient ivy, which a very old lady told me had been given to one of her ancestors, and was a cutting from the ivy growing over Lochleven Castle, in which the unfortunate Mary Queen of Scotts was so long imprisoned. This vine resembled my *old* favorite in many respects, but the leaves were not so large, nor so deeply serrated, and the fruit was of lighter color. In another one of these homes of our fore-fathers, resided a friend who owned an immense ivy of strikingly different kind. It was more tender, requiring protection during winter

around the roots, and would nevertheless lose many of its leaves. It never grew very high, although the main stalk was seven inches in circumference, and the growth rather dwarfish, but very dense and compact. The leaves deep green and small, the fruit orange or orange yellow, according to age; I think it was the Chrysocarpa.

Between fifty and sixty species have been discovered and named, but three however, (of the Ivy proper), are ordinarily cultivated in this country. These varieties are · Hedera helix, or English ivy, Hedera grandiflora, or Irish ivy, Hedera corcacia, or Colchican ivy. The climbing varieties are: Gracilis, Tortuosa, Lobata major. In the latitude of New York, Philadelphia, and Wilmington, Delaware, the ivy is perfectly hardy and grows most luxuriantly out of doors (or at least it did in my girlhood days); but since my sojourn west of the Alleghanies, I find it impossible to raise it, save as a house plant, and as such I have paid particular attention to it, and have it in luxuriant profusion from the vestibule to the kitchen dresser, for, say I, why not give our domestics something pretty and cheerful to look at, and endeavor to raise their ideas to love God's beautiful works. So it comes to pass that the old "Aunty" of ebon complexion, in *our* culinary department, has her window seat of plants and her ivy-clad dresser, which I am loath to admit often outrival the "pets" of the conservatory. The ivy luxuriates in rich, light soil, so I use two parts good garden soil, and one (generous) part well rotted cow manure, one part saw dust or "cocoanut refuse." Through this I also mix a portion (equal to one part) of charcoal well broken, in pieces size of a pea, or pieces of broken pottery. I make a good drainage at bottom, of broken sandstone or pottery, of an inch or more.

In April, I take tender young branches, from four to six inches in length, place in a box of warm damp sand, laying them rather longitudinally so as to cover two eyes. I then cover with a tumbler if in a pot, or with hand glass (of five panes of glass) if in a forcing box, and such a box and glass are very valuable for all cuttings. In about two weeks these cuttings will have formed roots, when with a large spoon or trowel, I remove into pots or boxes of prepared soil, and give enough water to moisten thoroughly. In June, place on the portico or plunge in the border. In October, bring again to the porch, take out a portion of the soil and renew; wash the leaves well with soap suds, and sprinkle, and before frost remove to winter quarters, but do not keep too warm. During the winter give a weekly stimulant of manure water, one bushel old hen or cow manure to a barrel of soft water, one-half a pint of this liquid to four gallons of warm water. (Other stimulants will answer).

The variegated sorts should never be potted in rich soil nor have any stimulants, as this will mar the beauty of the markings. This rule holds good with other bright or varicolored plants. Ivy loves moisture and shade, and above all cleanliness. After a good sponging and sprinkling, each dripping leaf will seem to give you thanks for the refreshing bath. Give as much air as possible, and plenty of light for the variegated sorts. When a plant grows old enough to produce berries, it may be propagated also by planting the seeds, which however is a slow process. Layering also is a usual way of increasing the number of plants, and this is always a very desirable mode. Take a branch with several "eyes" and either lay it upon the ground and put an inch or two of moist soil upon it, with a few pieces of stone to keep it in place, or peg a young branch into a pot of soil; in either case the roots will form in a week or two, and may then be cut from the main stalk and repotted. An old plant which is growing luxuriantly, when it has attained the utmost height of wall or trellis, has a habit of throwing out young branchlets, called by florists "fruiting branches," and if examined it will be found that these differ somewhat from the main or parent plant in foliage and bark. These young branches are propagated by grafting or budding, and often the top of a frame or chimney will appear as if capped by a young hedge from a foot to several feet in height, of young, tender and vivid green leaves.

The ivy is at once the most attainable, the most beautiful and satisfactory creeper we have, either for balcony or house cultivation. It will grow with even ordinary care, and indeed oftentimes without any, and in almost any location or soil. Its glossy, varnished and leathery leaves enable it to withstand various changes of temperature, and alike in shade or sunshine, heat or cold; once established, we find the hardy varieties climbing over rocks in rich profusion, festooning the pillars of the palatial mansion, or covering the thatch of the humble cot—an ornamental wreath, twining the richly carved portico of a living screen, hiding deficencies of ornament and paint in the dwelling of the more humble.

The ivy may be particularly recommended as a house plant, for although in our southern and middle states it is perfectly hardy, in the western and northern states it appears difficult to keep it through the severe winters. But as it is well adapted for a house plant, those who value its beauty and loveliness will find it admirable and satisfactory for indoor decoration of various kinds. Trained around the mouldings of doors and windows it forms a beautiful and graceful finish, and also as an arch over folding doors. Alone or mixed with other plants in hanging baskets, or on plant stands, its dark green foliage will be found a beautiful object. No plant is so readily fashioned into beautiful and artistic shapes. Wire and a few laths, and you may form, arches, crosses, crowns, and indeed an innumerable host of beautiful objects, around which it will gracefully twine. The hall, the drawing room, the social center table, or the festive board, are alike beautified by its graceful festoons, while as well it forms the canopy under which the lovely bride "plights her troth," or in that solemn hour when some loved one is given to the cold earth, "dust to dust and ashes to ashes," it forms the cross, or wreath or crown; and in decorating God's house it is sought for as the most appropriate and beautiful symbol.

In Germany, where it is used by rich and poor for indoor adornment, it will be found trained over the doors and arch of the vestibule, up the staircase, around lamp posts and brackets, in the arbor-like recess, where stands the piano or sofa; as a wreath or arch over some favorite statue, or framing the face of a beloved friend; as a screen in the dwelling, or in the stores around the supports of the shelves or lining and arching the windows. In *Window Gardening*, our "mutual friend" Mr. Williams gives us some beautiful imagery regarding the ivy. He says: "Its presence (it must be admitted), with its entwining luxuriant foliage gives a refreshing and pleasant look to every apartment; of uncounted worth is it in homes where garden facilities are few or none, and a sprig of green is considered equal to the nobleman's wide and rural estates." Again, quoting from a favorite author, he says: "A single root has been known to wreath a bow window with thick garlands, and then strike off into lovely independent paths along picture cords and above the cornice, till the room seemed all a-bud like Aaron's rod. It will cover a screen of wire, curtain curtainless window, festoon a pillar, frame a favorite picture (and what more graceful or delicate frame could be desired?), arch a door, climb and twist about a window sill, and swing in long-looped tendrils from a bracket. There is no end to its beautiful uses."

Although this lovely plant will flourish best in damp rich soil, it is adapted to almost any situation, will bear various changes of temperature, and is not at all sensitive in regard to light. If permitted to dry out it will show the effects of the neglect, but at the same time it must be kept *well drained*. The variety called Kenilworth or Coliseum ivy (Linaria cymbalaria), is a delicate and lovely trailer, growing readily in a light sandy soil. The leaves are small and purple upon the under surface. It grows in massive but delicate and graceful profusion on the tops of old buildings in Europe. The roof and turrets of the old cathedral in the city of Milan are thickly covered with it, and it appears to come tumbling forth from the damp recesses between the embrasures of the windows and towers. The flower is very delicate white and lilac, with a little straw color about the stamens. It is a

beautiful object for the hanging or wall basket, and is readily propagated from cuttings or seeds (which sows itself). In *Window Gardening* we have some beautiful designs for *baskets, vases*, etc. for the ivy. An iron frame for an ivied garden seat, wall baskets for stair case, several hanging baskets and stands, and a receptacle to be placed behind frames; for this last I have found the flat tin oyster can to answer admirably. Make a good drainage and fill with earth, then plant the ivy and suspend from the pictnre or minor nail, with cord passed through a hole in the can. Vials of water thus suspended behind frames will keep ivy fresh and growing for months, and often the finest plants are thus formed. As there are many persons distant from floral stores or who have not the means to purchase articles to decorate their various apartments, I will add a few simple vases, boxes and baskets of home make.

Window Box for Ivy and other Plants.

Make a box to fit the window and not less than six inches deep, nail a lath to the upper and lower edge, cover the whole with heavy brown paper. Make leaves of the same paper by cutting in triangles and folding, also six rosettes or flowers for the corners and center. Tack the leaves one over another, reversing at the center, where place one of the rosettes (above and below). Varnish the whole with shellac, and then with copal, and you will have a tasteful box. The rosettes may be made of various styles. I cut six scolloped, circular pieces, each one smaller than the other.

Wall Basket for Ivy.

Take any wooden bowl or box of desired size, make a decoction of logwood chips or burnt umber scalded in vinegar, stain the bowl and hhving sawed in half, nail against the wall, each side of a door or staircase. Take three two-forked branches (with the bark pulled off here and there) of grape vine branches or roots; nail against the bowls with ends interlapped, to form a net work; fasten the three single ends together at bottom and nail on a bunch of cones, leather leaves or acorns, and also an edge of the same around the top; stain the whole and when dry varnish. If a handle is desired, make of twisted grape vine. C. S. J.

The Greenhouse.

Greenhouse for June.

PLANTING outside should now be complete unless ungenial weather has prevailed during the end of May; in this case, such plants as Coleus and Caladiums have, in some instances, been reserved under glass a short time later than usual, but the earliest opportunity should be now taken to complete all planting operations; for we must now expect hot, dry weather, which is not favorable for fresh planting; the plants become thoroughly dry before the roots have started in the fresh soil. It was so cold and stormy that we could not plant out our Verbenas until the 27th of April, and it is not unlikely that more tender plants will be planted later than usual from the same cause; this will prevent a general regulation of the houses until later in the season than usual, but all the more hardy plants should be at once placed in summer quarters, which must be sheltered from the wind and in partial shade, but not under the drips of trees. Precautions must be taken to prevent the entry of worms in the pots of large plants, either by standing the pots on bricks or a good thickness of coal ashes; there is nothing better than coal ashes for plunging pots out of doors, it absorbs moisture and also drains the surplus water away, and keeps the roots cool; this is one of the advantages of plunging pots out of doors. If the pots are exposed to the dry air of our summer, even when not exposed to sun, many of the feeding roots are killed, and the plants become unhealthy and a prey to various insects. As a case in point, a gentleman from California mentioned, recently, that his Camellias did much better when plunged; in fact when turned out of doors without plunging, he obtained no flowers the following winter, and we have frequently seen poor, scrubby Azaleas from the same cause. In one instance the plants being placed in full sun, standing on boards, as a natural result the plants were dust-dry and smothered with red spiders. If

the plants are in good condition when plunged no other precaution is required to prevent the wind from blowing them over, but if not plunged, precautions must be taken by staking and tying, or there will often be pots and plants broken from that cause, besides the loss of time in fixing the plant in place again. All outside pot plants will require frequent attention in watering both at the root and overhead.

Pelargoniums will now be in full flower and will require abundance of water, with ventilation day and night, and shade from bright sun. As soon as beauty of bloom is past, the plants must be placed out of doors in a light place, to ripen the wood previous to cutting down. Fancy varieties are best placed in a shady frame with plenty of air. These sorts do not keep well during the summer if treated the same as the strong flowers.

Geraniums intended for winter blooming must be potted into the flowering pots and plunged out of doors; give plenty of water and cut the flower stems away as they appear. Small plants of any choice, variegated varieties, it is desirable to keep in pots, must be grown in a shady place as cool as possible.

Fuchsias must be kept as cool as possible with shade and plenty of moisture in the air; if grown in a close hot-house at this season, the foliage will fall off before the plants finish blooming.

Cyclamens must be placed in a shady place or planted out on the north side of a wall; here they require no attention in watering, and will take care of themselves.

Double Primulas must be placed in a cool, shady place, where little watering will be required; the same may be said of Primula Nivea, which is a perfect little gem, but little grown in this country. It is nearly related to the Primula auricula so much grown by English amateurs but seldom seen in this country, for the reason that plants import badly, and our hot, dry summers, and cold dry winters make the introduction difficult.

Coleus.—A few plants of the best colors should be potted into eight or nine inch pots for growing indoors to fill up any odd corner in the greenhouse, or for decorating on a special occasion. By pinching the shoots frequently, the plants will make dwarf, compact bushes; but do not pinch too late, or the full size and color of the foliage will not be developed. Princess Royal, Queen Victoria, Golden Beauty and Chameleon are good for the purpose. When the last named variety comes in good color it is very beautiful.

Heliotrope.—If it is not convenient to plant out any on wall of greenhouse for winter cutting, a few plants must be grown in pots for that purpose. A few old, woody plants if cut in during summer and repotted in good soil, kept growing outside until risk of frost, and then grown in a warm greenhouse will give quantities of cut flowers during the winter months, and also furnish cuttings for propagating.

Calla Lilies should be now placed out of doors in full sun, and receive but little water during the next three months; the foliage will decay, but that does not injure the plants; they will grow more vigorous during the winter for this treatment. If plants are required for a pond or fountain basin, this is a useful plant for the purpose; it will grow and flower all the summer if standing in twelve or fifteen inches of water, but under this treatment it will not flower in the winter. The Alba maculata variety has leaves spotted with pure white; this requires the same treatment as Caladiums, growing during the summer and resting during the winter. It is a desirable plant, although the flowers are not so large as the old species, and are not pure white.

Caladiums will now require abundance of water and also frequent syringing. Those grown under glass unless in a very moist house, are better shaded from bright sun; the colors are more brilliant, and some of the thin leaved, white varieties burn if exposed to full sun. If the late plants have not been shifted into full sized pots it must be done at once, or they will grow later than it is required, and occupy room required by the winter plants.

Gloxinias.—The early plants will now be in full beauty, and require abundance of water. The late plants will require shifting into roomy

pots if allowed to become much pot-bound, the foliage is small and the plants do not flower well. *Tydæas* and *Gesnerias* for winter flowering will require shaking out of the old soil and potting separate in small pots, or starting in pans, and potting separate later in the season, as most convenient.

Large Climbers will now require abundance of water at the roots, and well washing with the hose or syringe frequently over the foliage, to prevent the attacks of insects. We had the same plant of Thumbergia Harrisii in flower from the first week in November until May, which makes it a very desirable plant. Stephanotus floribunda will now be in full flower. This is a very useful plant, its principal flowering season being when white sweet-scented flowers are scarce. This plant makes its growth and flowers at the same time, so it requires abundance of water at this season. Lapageria rosea will be in full growth at this season; if the drainage is good it is impossible to overwater this plant especially when in full growth. Where failures have come under our observation it was usually from bad drainage and too little water.

Camellias will have finished growing and set their buds. Plants in pots are best in a shady position out of doors, unless a house is devoted to these plants alone. If any require potting or surfacing, it should be done at once. Do not disturb the roots for they are very tender and easily destroyed; give plenty of water and wash the foliage frequently, both for removing dust and to prevent red spider. The best flowers are obtained with the least trouble when the plants are planted out in the greenhouse. We commenced to cut Camellias the first week in November and have some fine buds to open the first week in May; this gives a more useful succession of flowers for the amateur than having all the flowers open at one time, and we have plenty of flowers for weeks after they are past in most places, the flowers are also much larger than when kept hotter. We measured some flowers from double white and Candidissima the last week in April; these flowers were over fourteen inches in circumference, and perfect in shape. If the soil and drainage is good, Camellias do not require fresh potting very frequently; it is better to give a good shift and then not disturb them again for several years if proper attention to watering is given.

Begonias for winter blooming must be potted into larger pots and well watered. These plants may be planted outside if desired, and lifted before danger of frost; they make a very stocky growth, and flower well under this treatment. Eranthemums and Justicias can be treated the same as Begonias.

Poinsettias and Euphorbias will be commencing to grow and will require shaking out from old soil and potting into smaller pots. These plants are frequently planted out but they do not take up well, and without great care lose many of their leaves, so that flowers are not so fine. The plants can be placed out of doors when rooting freely; they are best plunged in full sun, but not exposed to rough winds.

Agaves and Yuccas must be planted or plunged out of doors in full sun; they all make better growth, and the variegated sorts are better colored than when protected during summer. There is no class of plants better adapted to this climate, and there is a quaint grandeur about the plants possessed by few others. Many of the new species are finer than the old fashioned kinds. We hope Yucca Wipplei will prove hardy in this section; it is said to be the handsomest flowering variety of them all.

Azaleas will be now out of flower and growing freely. The pot-bound plants especially will require abundance of water, and all the plants thoroughly sprinkled overhead every bright afternoon; this is the best preventive for thrip and red spider; it will be more effective if it is possible to close the house for an hour or two afterwards. This cannot be done where flowering plants are in the same house, so that it is best, where possible, to keep Azaleas at this season with such plants as require closer treatment than is given to flowering greenhouse plants. The Azalea makes a better, stronger growth, and the flowers are

finer when grown in a brisk heat, but after the growth is finished plenty of air and light is beneficial, unless a second growth is desired. In this case the plants can be continued in heat until the autumn. It is quite a mistake to turn plants out of doors if there is room inside for them. One season's trial will convince any one on that point. These plants require but little shade at any time except when in flower, or if necessary to reduce the roots when potted, but this should not be done unless very large plants must be potted in same size pots again; this with amateurs is not often necessary.

We have been recently informed that Azaleas will not grow in California. This is very remarkable, as Heaths are said to grow well. We think it must be accounted for by their dry climate, breeding thrip and red spider, and the necessary precautions not being used to destroy it. If Heaths had failed we should have blamed the soil or water. It is a surprise and puzzle to us which we can not explain without examining the plants on the spot. Now is the time to give very large plants more pot room if they require it, but be careful the old ball is thoroughly moist before potting, and ram the soil as hard as possible round the ball of roots. If this is not done the water will run to the sides without wetting the roots and the plant probably die, or at any rate, become unhealthy.

We promised to give the names of a few new Azaleas. We will now give a few, and add others later in the season. We have flowered those named, and know they are desirable additions to this showy class of plants.

Alice—fine double, rose color.

Arthur Warocque—semi-double, cherry color.

Bernard Andreas alba, the best of the double white, and, although not quite so new as some of the others, is not yet in general cultivation; it lasts better than any other Azalea when cut, the flowers being of good substance.

Baron de Schickler—large double, rose color with dark veins, and dark red blotch.

Cocarde Orange—fine shape, orange scarlet, amaranth red blotch, very fine.

Countesse Eugene de Kerchove–pure white, streaked with lively cherry color, fine form.

Madam Mendel—Orange red, violet red blotch, very flowery.

Wm. George Merritt—fine semi-double flowers of brilliant violet rose.

President E de Ghellinck de Walle—very large, of intense rose, large lake colored blotch, with crimson rays.

Madamoiselle Marie Van Houtte.—This is a very extra large double white flower with an occasional dash of cherry color, but many of the flowers are pure white. It is a pity the Belgian raisers of seedling Azaleas give many of their pets such very long names, which are not easily abbreviated. The same fault may be found with the French Rose flowers, and the names appear to become longer each year.

Ixoras and other hard wooded stove plants will now be growing and flowering freely. These plants will require abundance of water and a sharp look out for insects, which will increase very fast at this season if not checked. If allowed to become dry or grown in a parched atmosphere these plants are subject to thrip which soon spoils the foliage. A slight shade is necessary during bright sun.

Crotons and Pandanus are best grown in full sun with plenty of moisture. The colors of foliage is much finer than when shaded. We were much amused at reading a recommendation in one of the English papers recently, by a writer on Pine apple cultivation, to shade the plants in May. It is very ridiculous to recommend such treatment in the English climate or any other, if the plants are good and ventilation properly attended to. We never used shading for Pines at any time unless for a few days in the height of summer, after shifting a batch of plants, and we have grown as fine fruit as any one, and the plants were at all times in fine condition. We have done nothing in Pine growing in this country, but the climate would suit these plants well if the heating power was good, but as a paying speculation we do not suppose it woudl answer in the face of West Indian importations of this fruit.

Marantas, Alocasias, and other fine foliage stove plants will require abundance of water and close shading from bright sun. If large specimens are required shift the plants as soon as pots are full of roots. We do not usually syringe Marantas over the foliage, for if the night temperature falls rather low with the foliage wet, it often causes unsightly spots.

Ferns and Selaginellas require abundance of water and shade from bright sun; see that scale does not become established at this season or the foliage is much injured. Lomarias, Woodwardias and varieties of Pteris are very subject to thrip if grown in a dry, hot place. This must be watched or the foliage is very soon spoiled. Sponging the few leaves on its first appearance is the best remedy, for it is difficult to give sufficient tobacco smoke to kill the insects without injury to the foliage when in full growth.

Orchids.—These plants will now require plenty of heat and moisture. Water the floors frequently, and syringe blocks two or three times in the day. If convenient to remove plants in flower to a cool shaded house, free from drying winds, the bloom will last much longer. The principal plants in flower will be Cattleya Mossiæ in variety, Cattelya crispa, Lælia purpurata, Cypripedium Stonei, Roezlii barbatum and Piercii, Lycaste Skinnerii and cruenta, Ærides in variety, and Dendrobium, Macarthæ and Dalhousieanum also Calceolaria. Those who are fortunate to grow Dendrobium Falconeri will now have it in flower. It blooms more free in this country than in England; it is rather scarce and expensive. At a recent sale in London of imported plants, fifty dollars in gold was paid for plants, and for a large mass of Dendrobium Wardianum more than five hundred dollars in gold was paid and for small plants in proportion. It must be remembered that they were dried up plants, after a long voyage from their native country. This proves that the taste for fine varieties of Orchids is rather on the increase than otherwise in Europe, and being sold by public competition would be supposed to be sold for their real value.

Scientific and Botanical.

Pelargoniums.

BY J. STAUFFER.

AFTER reading Mr. A. S. Fuller's article on page 113, April No. of THE HORTICULTURIST AND JOURNAL, an old botanist may be allowed to "ventilate" himself when his pet science is knocked into a cocked hat by the Floriculturists who have potted and repotted, not only pelargoniums but other flowers by raising multitudes of seedlings, till they have run one variety into the other, so as to put science and classification at defiance, and then giving a new name to every shade of difference. I find in Johnson's late edition of his Gardeners' Dictionary, about 250 species and varieties are named, among which hundreds of other names are not found. It is all right to improve, and as "variety is the spice of life," whether brought about by artificial selection, hybridizing or seedlings and special culture. That called Mrs. Pollock, with its exquisitely colored leaves, forming an ornament fit for a Lady or Knight of the Garter; be they variegated, golden and bronzed, or golden or silver edged, with their zonal centers, I, as a botanist, consider varieties of the sort, *Pelargonium Zonale* (and even in this the zone is not always present); but I go by types. At the Horticultural meeting held in the court house, Lancaster, Pa., Monday, April 5th, 1875, Mr. Daniel Smeych, No. 628 West King street, this city, had on exhibition the leaves and flowers of a series of five varieties, all successively raised by seedlings during a period of eighteen months. The plant he commenced with, is known to our florists as the "General Grant" (va. Zonale), leaves moderate, flowers large, of a deep and brilliant color. No. 2. A seedling of No. 1, flowers a shade darker red, leaves and flowers rather in size. No. 3. Seedling from No. 2, color of flower still good, size reduced, but the leaves much larger. No. 4. A seedling from No. 3, flowers changed to rose and orange tinge, size good, leaf reduced in size to that of No. 3, but larger than 1 and 2. No. 5. A

seedling from No. 4, here the flower assumes a bright orange or brick-red, and the leaves are reduced in size, and much smaller than in any of the other seedlings, and seemed to have reverted to a species introduced in England as early as A.D. 1800, the *P. lateritum*. Thus, it seems "General Grant" has gone back on the floriculture of friend Smeyche. How is this, brother Fuller? By-the-by, the *P. lateritum*—Johnson says was one-half inch in diameter—you say a "few years since a geranium flower an inch broad would have been considered rather remarkable, but now with such sorts as *Father Ignatius*, a full two inches in diameter, is not uncommon." I have seen such, but I am not a horticulturist. I have seen the smoke of a cigar change the color of flowers; ammonia does the same. Prof. Gabba says that a violet colored aster which had no smell had acquired a red color and a delightful fragrance under the influence of ammonia. The Japanese, by means of injection which they kept a secret, can color or whiten flowers and obtain wonderful variegation. The Chinese have a secret to dwarf trees. "The Garden of Acclimatization has at this moment an orange tree a hundred years old, and imported from China, no bigger than a rose tree; its fruit scarcely attains the size of a cherry." (*Journal de la societé centrale d' horticulture de France.*) I quote my authority.

I am tempted to venture on a topic on the relation between one form and another, or the science of Morphology, but I am admonished that readers generally prefer the practical matter of fact statements, and do not care to enter into what too often seems matters of speculation. I will therefore conclude that notwithstanding our florists produce such wonders, that some are inclined to take out a patent, but alas! the result of these wonders are truly called sports, so far as the human agency is concerned. And yet, there is a law of forces that governs all these changes, whether we understand them or not. Much can be said on judiciously selecting the fittest and promoting its fullest development; so far much has been done, and no one can set limits; nevertheless these fine varieties of the hot-house, under home culture, are inclined to be short-lived, and prone to go back when neglected; a change of soil or condition arises by the transfer. Thus, gardeners are often censured for that of which they are not guilty, as there are some however, who have sins enough to bear. It is still well to use the mantle of charity, and attribute many failings to a want of better knowledge, and not for want of a good will to do justice to their customers.

Lancaster, Pa.

The Introduction of New Plants.

BY A. S. FULLER.

THERE is a right as well as a wrong way of doing business, especially if one expects to gain the confidence of customers.

Of course there are persons who cannot understand why their own individual opinions about a matter of which they are undoubtedly ignorant is not just as good, and should carry as much weight with the masses as that of the highest authorities.

No one will deny a man to "his own opinion," even if it conflicts with that of others, who have had opportunities of knowing more as well as of becoming better qualified to judge of the subject under consideration; still it appears to me there should be some limit to the audacity of ignorance.

Probably in no one line of business are there more frequent exhibitions of this, than in horticulture. For instance, we will suppose Mr. B., who has never seen or cultivated a first rate variety of raspberries in his life, finds one growing wild in the woods or fence corners, or perhaps he raises one from seed, and if it happens to be the best known to him, he immediately proclaims it to be *the best* known to the rest of mankind, and enforces his opinion by certificates from others equally as ignorant of the facts in the case as himself.

Now when a man asserts that this or that variety is the best of the kind known, it is but reasonable that the public, of whom he may be asking favors, should inquire upon what grounds the assertion is made. Has the supposed-to-be superior sort been compared under

the same conditions with other standard and well known varieties? Have men who are known to be well informed, in regard to the class of fruits to which the new variety belongs, passed an opinion upon it? or, are the claims of superiority based upon no better foundation than the wish of some individual to make a little money out of the sale of plants?

These are questions which the purchasers of new fruits and other plants have a right to ask, and should ask before investing their money in things of which they know nothing personally.

I am not saying this to cast any reflection upon our well known florists, or nurserymen, because they are in the main authorities, and do not offer new plants without knowing their comparative value, but to warn the novice against that class of "unknowns," who are constantly announcing wonderful things, of more wonderful origin, of which men most likely to know, unfortunately know nothing.

It is an old adage that "good wine needs no bush," and any man who possesses a new fruit, flower or plant, superior to any thing of the kind known, need not be afraid of submitting it to our best authorities, and he that fails to do this, and obtain their opinion, requires watching, to say the least.

Cycles of Plant Growth.

BY WILLIAM BOWSER, RICE CO., KANSAS.

I WISH to call attention to a habit of plants that few observe, and none have thought of sufficient importance to call attention to. Having lived on the prairies of Illinois for twenty years, and given attention to the growth and bloom of all the plants and grasses that grow on them, I am convinced that very many of the plants, if not all of them, have a minimum and maximum year of production of flowers in a circle of years. They decrease yearly from their maximum, to their minimum, and then increase again to their maximum. The length of the circles of years of the different plants varies greatly, some making the round in four years, others in sixty to seventy. I have noticed the fine bloomers the most. I cannot give their botanical names, but I will try and describe a few of them, so that people of the prairies will know them.

The first plant that attracted my notice was an early bloomer. It sends up a smooth leafless stem, ten inches or more in height, producing flowers at the top, on long slender stems, and spreads them round, very much like the burners of a chandelier. It is the sweetest flower of the prairie, and makes its round in about fourteen years.

Another plant is a beautiful phlox, that grows in damp places. Makes its round in about eight years, and nearly dissappears at its minimum.

Another plant sends up a square stem about two feet or more in height; produces a fine head of small, trumpet like flowers that come out from the corners of the stalk. It makes its round in about eighteen years.

One lily makes its round in about sixteen years; and a small lily that blooms late in the fall takes about thirty-four years. One other plant, that was called the crimson plume, must take about sixty to seventy years to make its round. It grows on wet land, and sends up stalks four feet in height. Its head of flowers is a perfect plume, from one foot to eighteen eighteen inches in length; the flowers are a crimson scarlet, brilliant as the scarlet verbena.

This habit of plants may have much to do with our different varieties of grains running out, as we call it. They may only be running down to their maximum year. All men notice how abundant the bloom on the prairies is some years to what it is others; but they do not notice that the plants reach these high and low stages of bloom by a gradual yearly increase and decrease. The prairies are the only good place to learn those changes in plants, and if men living on the large open prairies, will give some attention to the habits of plants, take notes of what they see, and keep dates, they would soon begin to arrive at definite conclusions.

The rosinweed and others of the many varieties of the sunflower family are every other year plants; but this does not exempt them from making the great round. The hardwood

shrubs of the prairies are subject to the same habit. I will name two varieties: the red-root of Illinois, and the little acacia, of Kansas.—*Prairie Farmer.*

The Respiration and Growth of Plants.

BY PROF. ASA GRAY.

IN the *Gardeners' Chronicle*, of Nov. 28, we have at length a clear and good abstract of Corenwinder's paper on Respiration and Digestion in Plants. Respiration in plants as in animals, is an oxidation of the carbonaceous matters, and goes on continually, increasing or diminishing, however, with the activity or repose of the plant or animal. It is manifested and its amouut measured, by the giving off of carbonic acid gas. Digestion or assimilation is the reverse process as respects the storing up of carbonaceous matters, through the decomposition of carbonic acid, and is evinced and measured by the evolution of oxygen gas. In growing buds and shoots, and forming foliage, the process of respiration is the most active. The plant—as we should put it—is then doing active work, and work means using up of material and force. Just as it costs the farmer a part of his crop to raise it and take it to market, so it costs the plant a part of its product to move and re-arrange its particles when it grows.

In the developed foliage, outspread in the light, the work of digestion or assimilation is the principal thing; and the result is the making of the material for growth. The work also uses up some already formed material, converting its carbon into carbonic acid, but this loss is unperceived and overbalanced by a far greater gain. For every one particle of vegetable matter which is now decomposed into carbonic acid and water are given out, probably twenty or thirty are recomposed in the assimilating process out of carbonic acid and water, and the oxygen of former given out; so that the net result as to air is the setting free of oxygen largely, as to the plant, the increase of vegetable matter.

Besides the carbonaceous elements, there is the nitrogenous matter and the phosphates and the like. These play the most important part in growth and in all vegetable action. They are accordingly most abundant in young and growing parts, or in parts preparing for future growth. A Lilac leaf dried in April was found to have nearly twenty-eight per cent. of nitrogenous matter to nearly sixty-eight of carbonaceous; a Maple leaf at the same season as much as forty-one per cent. of the former to fifty-three per cent. of the latter; but in October the nitrogenous matter of the Lilac leaf was reduced to less than nine per cent., of the Maple leaf to less than fifteen per cent. The phosphoric acid had decreased in a similar way. The precious materials, having served their purpose in the young and growing parts had been economized, and had been largely transferred to other new parts, and finally accumulated and condensed in fruits and seeds to provide for the nutrition of the next generation, or, in the grower's hands, to serve for the nutrition of another order of beings. The practical moral is, that young herbage and foliage are more nutritious and more palatable than when old, as we fully appreciate in the cases of a salad, beet-tops spinach, asparagus, etc.; but that fruits and grains offer similar nourishment in a much more condensed form.—*Ex.*

Boxwood.—The supply of boxwood (*Buxus sempervirens*), demanded for the best kinds of wood engravings, is gradually falling short. The largest blocks are the produce of the countries bordering on the Black Sea, but the yield has become very slight. In 1873, 2,897 tons, valued at £20,621, were exported from Poti. From 5,000 to 7,000 tons of the finest quality annually pass through Constantinople on the way from Southern Russia and Turkish ports to foreign markets. About 1,500 tons of an inferior wood is annually supplied from the neighborhood of Samsoon. The boxwood forests of Turkey are nearly exhausted. In Russia a considerable quantity of choice wood still exists.

The Flower Garden.

Tropical Effects.

BY E. S. CARMAN.

THE Canna, Caladium and Ricinus are, in the main, relied upon to produce the tropical effects now, perhaps, enjoying their zenith of popularity.

Who among us that have pondered over a new and altogether dazzling arrangement of our flower-beds for another summer, have not pictured happy imitations of that clustered luxuriance, stateliness and vigor of growth that waste themselves in the shadowy nooks and entanglements of equatorial lands—those mysterious resorts of strange and ferocious animals that there prowl about or idly fatten upon the wild abundance? And it is, we fancy, a desire, of which such picturing is a part, that has made for years past a prominent place in every garden for such specimens or groups as the Canna, etc., are so well adapted to form.

We have no word of disparagement to utter against the bold, incomparable beauty of their maturity; we have only to regret that almost before this has been reached, a cruel frosty night must needs come to cut them to pieces; and we find in the morning but the seared and unsightly remnants of our pains and care. Thus it happens that we are ready to conjure up combinations to produce something of this exuberance of foliage that shall develop their richness earlier in the season, and continue later in the fall, than the favorite plants to which we have referred.

Our own idea of a pleasing substitute—imperfectly executed in our own grounds last summer—is as follows: The plot was a circle sixteen feet in diameter, with a grass-sod margin. In the center was a clump of *Arundo donax*, a reed of the most surprising rapidity and strength of growth, that attained by the middle of September the height of 14 feet without manurial stimulant. In its firm, straight, jointed culms, with leaves that remind one of so many pennons from a mast, it is a curiosity in itself—little known in the North, though indigenous to certain Southern States—elegantly suited as the central figure to such a group as we propose. The variegated variety of this reed, though appropriate in masses of Amaranthus, Coleus and the like, is of slow growth and not to be recommended in this connection.

At a distance of three or four feet from the Arundo, on either side and parallel with the walk, was a clump of Erianthus ravennæ with its elastic, long, gracefully-waving leaves, and later, its bright, silvery, abundant plumes of inflorescence. Next, so as to form a square if connected, were four Hydrangea quercifolia—a noble shrub that only of late is attracting half of the appreciation it so fully deserves. Its large, deeply-lobed leaves and robust, careless habit place it in entire harmony with the effect desired. Magnolia glauca, preserved as a shrub, is also in keeping—and such plants as *Hydrangea paniculata alba* with its really immense and long-persistent trusses of flowers—the new *Poppy orientale* with its vivid, carmine and black flowers, will offer a cheerful relief, while they serve by their lower growth when placed nearer the perimeter of the circle, to preserve a general uniformity.

All of these are perfectly hardy and may be trusted to pass through our severest winters without the least protection. Our tropical bed when once completed is always completed, and exacts no other attention than that of maintaining it weedless, trim and tidy; and there are no bulbs and roots to be taken up, washed, dried and carefully packed away to be examined many times before another season of manuring, replanting, patient-waiting, watering and bother arrives.

Thus we submit, similar effects, as pleasing as those of the annual groups, may be created without the palpable objection that attaches to those plants. If among our house-plants we possess specimens of *Ficus elasticus*, *Abutilon Thomsonii* or *Vexillarium*, *Beaucarnea recurvata*, Yuccas or even Cacti, and we yet have room to spare in the circle, these may be introduced with pleasing results.

River Edge, Bergen Co., N. J.

About Dahlias.

BY A. S. FULLER.

OF late years the *Dahlia* has been gradually losing its former popularity, although not through the interference of any competing rival.

There is certainly no other flower which approaches it in symmetrical regularity of form, and few equalling it in brilliancy or variety of color. It lacks, however, one of the most essential properties of a flower, which would make it popular for any considerable time, namely, an agreeable fragrance, but this fault is a common one among some of our most showy and extensively cultivated plants.

It may be that the perfection attained in colors and form of this flower, has been one of the main causes of its declining popularity, and the chances of improving or even producing novelties being so few, that cultivators became discouraged, after making their many fruitless attempts in that direction. But whatever may have been the cause, the fact is quite apparent that the Dahlia is far less extensively cultivated than it was a few years ago.

It seems that we must be either going up or down, despondent or enthusiastic, there being no smooth and pleasant *non*-exciting paths even in our floricultural affairs, and the very *acme* of perfection would be no more satisfactory than the manipulation of the most crude materials.

The old large Dahlias are, it is true, rather coarse kind of flowers, but not half as "straight laced" as the hollyhock or much lauded *Zinnias*, for the plants are among the most sturdy as well as graceful in outline, and the blooms showy if not sweet. But of late years, a new class has been introduced under the name of *Pompone* or *Liliput Dahlias*, which are so unique in habit and style of flowers, that I have been inclined through them to renew my acquaintance with the genus. The flowers, like the large old sorts, are perfection in form and color, but so small in some of the varieties that they would almost answer for a buttonhole bouquet. To call one of these little Pompone Dahlias not more than an inch or inch and a half in diameter, and as round as though turned out in a lathe, every petal perfectly quilted, a "coarse flower," would be ridiculous; hence, that objection cannot be consistently urged against the Pompones.

The plants are also proportionally small, frequently blooming when not more than a foot or eighteen inches high, although they will reach two or three feet by autumn.

The culture is not necessarily different from the larger sorts, a good, deep rich soil being required to insure perfect and abundance of bloom.

When the frost has wilted the leaves in autumn, the tubers should be dug, and when well dried, stored in a warm dry place. Those who have no conservatory in which to keep such roots, will find that well dried sand or pulverized charcoal are excellent materials in which to keep Dahlia and similar tubers. The tubers may be packed carefully and closely in tight boxes or barrels, and then the dry sand or charcoal poured in to fill up all interstices between, then set them away in a dry cellar or room where there will be no danger of freezing.

The sand used for this purpose must be *very* dry; common sand from the open ground will not answer unless kiln dried or kept under cover until all moisture has been expelled.

Varieties.—To undertake to name a dozen or more of the very best of the Pompones would be a difficult task, because there are so many that are really superb. But I will name a few that are quite desirable.

Arndt—magenta color, with brown spots.

Ardens—bright scarlet.

Bride of Roses—rosy lilac.

Burning Coal—deep yellow, edged with scarlet.

Child of Faith—white, tinged with pink.

Little Kate—velvety purple.

Little Wonder—crimson, fine form.

Little Harlequin—crimson, tipped with white.

White Bedder—pure white.

Zarte Nelke—white, striped with crimson.

Raising Plants from Cuttings.

A CORRESPONDENT of the New England *Farmer*, in Kansas, thus answers an inquiry:

The plan that has proved most successful with me in our out-door management is as follows: Prepare the cuttings of a convenient length for handling (say about ten inches), of the last year's wood. Let the lower end be cut off smoothly, just below a bud; cut the top end about an inch above a bud. After a little practice, it will be no trouble to follow this rule, and one will always be able to distinguish the top and bottom ends of cuttings at sight. Grape cuttings on this plan should contain from two to four buds. Tie the cuttings in bundles about three inches in diameter, with willow twigs or small wire that will not rot in the dirt; make the butt end of the bundle even, and tie tightly. Heel in the cuttings in dry, mellow ground, with the butt ends of the bundles up, and the top ends down. cover the pile from four to six inches deep with mellow earth, pat down smoothly and administer a good drenching of water. Then cover the bed with manure, fresh from the stable, deep enough to prevent freezing during winter.

On the approach of warm weather, when the frost has all left the ground, and night frosts have nearly ceased, take off the manure but do not disturb the earth or cuttings. Let the cuttings remain well covered with dirt to keep them moist while the surface of the covering is gradually warmed by the sun from day to day. After most other spring work is done, examine your bed, and when the buds are well swollen, so that rather careful handling is necessary to prevent damage, then raise and set out the cuttings in fine, mellow soil. Set them deep enough, so that the top bud will be just at the surface of the ground, and so that a mulch of chaff, sawdust or cut straw will hide it. This treatment of cuttings should be begun early in the fall, and it will be perceived that we have used bottom heat all the time—first manure and second the sun. And generally it will be found that our cuttings have become well rooted, and all are likely to grow, if handled carefully. The setting should be done from a pail partly filled with tepid water.

Any person wishing to commence the treatment in spring, should begin it at the earliest moment that digging can be done. In all cases the cuttings should remain in the bed as late in the season as they can be handled without destroying the buds. It will always be found that the butt ends are more advanced than the top ends. Great care must be taken to preserve the roots, and the bud at the top end.

We never propagate the pear, apple, plum, peach or cherry from cuttings. Quinces, gooseberries, currants and many other plants are easily grown from cuttings. Apple trees are propagated very largely in the west by root grafting.

It is sometimes a great service to shade young plants from the noon-day sun during dry, hot weather. This can be done by sticking bushes or branches, filled with leaves, along the rows quite thickly. At first the green leaves afford thick shade. The sun and winds gradually destroy the leaves and they become mulching. No weeds should be permitted to grow among cuttings.

Wintering Echeverias.—Echeverias which have served for borders, beds, or floral inscriptions during summer, if potted to pass the winter, are liable to rot or spindle up. A method of preserving them, which occupies practically no room whatever, and which avoids the above mentioned inconvenience, is to shake out the earth from their roots when taken up in autumn, and suspend them heels up or anyhow, in small bunches, on strings stretched horizontally, like linen hung on a line to dry, beneath the roof of a cool greenhouse which just keeps out the frost.—*Gardners' Chronicle.*

VAN HULLE, of Ghent, Belgium, has received the buds of a water lily from Paraguay, that is said to excel the Victoria Regia in size and beauty.

Gardening.

Suggestive Notes.

Convenient Labels.—One-half the pleasure in growing our plants arises from the knowledge of their names and whence they come. In fact, we desire some little memorandum that will remind us, every time we look at them, what their title is, what their native country, from whom procured, and sometimes additional remarks of an explanatory character. An ordinary flat surface would have to be too large and unsightly, so we use a four-sided stake, one and three-quarters inches in diameter, planed smooth, and painted white. They should be about twelve or fifteen inches in length and pointed. When desired for use, rub lightly over the surface a thin coat of paint, and write thereon with a lead-pencil, which will last for two or three seasons distinctly.

The four-sided stake or label is preferable, as it is comparatively inconspicuous, gives a greater amount of surface for writing upon, and always looks neat. It is especially adapted for rose beds, groups of flowering shrubs, or masses of hardy border plants. True, it has not the merit of being imperishable; in fact, it should be replaced rather too frequently, but we like the appearance of wooden labels and we like to write upon them. The four-side stake for supporting roses and other plants may be utilized as labels by painting, say six inches of the top white, whilst the remainder looks best green. This top may then serve the same purpose as the above named label.

Early Wild Flowers.—Almost every one living in the country seems to be acquainted with our early blooming native plants, but how many undertake their cultivation? And yet, there is no mystery about the operation whatever; all that is necessary is to pay a little attention to the natural surroundings of their native haunts, so that when removed to their new homes they shall not droop away on account of the little necessaries that seem needful to insure health. Some prefer a partially shaded spot, others a moist location, and yet, again there are those that thrive best in dry and exposed situations. A little leaf-mold and sand, mixed with rotted sods from the best general soil for such plants, but peat where available is decidedly conducive to their health and rigor.

The following are all very pretty and are not difficult to cultivate: Wood Anemone, Rue Anemone, Silver-wort, Spring Beauty, Mountain Pink, Red-root, Dog-tooth violet, true violets of different kinds (especially the Bird's-foot violet), etc.

Low Growing Annuals.—These as too frequently seen, in the usual mixed border, are unable to do themselves justice, consequently to show to the best advantage each must have a separate bed to itself. Then if these individual beds are grouped together, so that the whole may form a tasteful design, the effect will be still greater, and each will show to better advantage by the contrast of color. For this purpose we have been especially pleased with the *Sanvitalia procumbens*, a neat little trailing plant, producing all summer long an abundance of golden yellow flowers, the double form of which is particularly pleasing. Since the advent of the *Double Portulaccas* they have been gradually increasing in favor, until they now stand at the head of this class of plants. The combination of brilliant colors makes a striking contrast. Of course no one would think of doing without the *Phlox Drummondi*, in its greatly improved condition. We have noticed beds filled with a single color, such as pure white or bright scarlet, than which nothing could be much finer. The fragrant annuals, such as *Mignonette*, *Sweet Alyssum*, etc., form useful rather than highly attractive beds, yet they may not be lightly passed over. They merit a spot in every garden and repay for their culture by the sweetest of odors. *Whitlavia grandiflora* is a lovely little annual, producing most of the summer a succession of little purple bells. When planted thickly in a bed devoted to itself it forms an attractive object.

Chrysanthemums.—A long name for one of the most useful of all our autumn flowers. To grow them successfully, not as they are usually seen with a perfect forest of stems from a single plant, requires a certain amount of care and attention. Indeed, it requires a skillful gardener to form a specimen for exhibition that shall be perfect in outline, with flowers evenly distributed and on every portion of the plant from the surface of the pot to the summit of the specimen. The only correct method is to commence with a strong cutting and as soon as it is rooted and potted off pinch out the top, when it will at once throw out three or four side shoots, which must be again pinched when two or three inches long. These in turn will contribute their quota of young branchlets to be pinched as soon as they are of sufficient length, and this should be persevered in until the middle of the summer, when it must be discontinued to allow the flower-buds to form. In the meantime the young plant must be frequently repotted, each time giving it a size larger pot, using a very rich fibrous compost, and watering once a week with diluted manure-water. During its young state it should be grown under glass and be freely watered as well as syringed once a day, but in early summer, when it has received its final potting, into, say an eight-inch pot, it may be removed to the open ground, and the pot sunken to the rim. Occasionally our summer suns prove too severe upon the foliage, so that a partially shaded situation seems to suit it best. Never neglect to supply them with water even at this late period, and if the surface of the pots should be mulched with a little manure, the plants will be the finer for it. Upon the approach of cold frosty nights, remove to the greenhouse or window and we will thus secure an ornament until Christmas, which will be difficult to surpass. Provided the pinching has been performed successfully, the plant will be as round as a ball, and the flowers will break from every portion of the extremities of the branches.

Forcing Strawberries.—A friend who has been very successful in performing the above operation, says, that after having tested several methods, he now prefers plunging pots filled with soil around the stool-plants, and allowing the runners to root therein. A great advantage is derived from pounding the soil quite hard. Towards the end of the season cut the young plants loose from the parent and resink the pots in tan, placing a frame of boards around them. As cold weather approaches, cover with hot-bed sash and protect with shutters or mats, banking up at the same time with fresh horse-stable manure to keep out excessive frost. The best bed for forcing strawberries is one filled with tan-bark for plunging with hot-water pipes beneath to give a brisk bottom heat. At first the top heat should be low, but as the plants show an inclination to grow this must be gradually increased, until a high moist temperature is attained. Red-spider, that terrible pest of the forcing-house, may be kept in subjection by constant syringing, and the plants are benefited by this frequent application of water, excepting when in blossom.

The Bell Flowers.—This is one of the largest genera of hardy plants to be found in our collections, and embraces some of the choicest species and varieties of perennials known to florists. Whilst some of these, such as the *Canterbury Bell*, appear to have been generally known among all classes of florists, there are others that have been passed by with little or no attention.

The *Hare Bell* (campanula rotundifolia) of Scotland, as well as of this country, is an exceedingly neat little species, quite hardy, and well deserving of cultivation. There is also a beautiful pure white flowered variety of this, which must be seen to be admired. The *Noble Hare Bell* (C. grandiflora of former botanists, now Platy-codon) is a valuable plant, growing about two feet high and producing large blue bells, late in summer. The *Carpathian Hare Bell* (C. carpatica) is dwarf in habit and makes a pretty ornament for rock-work. Flowers deep blue, but there is also a white flowering form equally pretty. Another interesting little alpine species is the *Campanula turbinata*, attaining only to the

height of three or four inches, and bearing numerous deep purple flowers, large for the size of the plant.

Some of the family form beautiful pot-plants, among which might be especially noticed the *Pyramidal Bell Flower*, a noble plant growing with good cultivation several feet high, and usually covered with blossoms from the surface of the pot to the summit of the plant. They are all easy to grow, and no garden can be called complete without some of the species, or at least a portion of the choicer garden varieties.

Premium Roses.—No plant is more sensitive to neglect, nor shows more plainly the result of careful culture than the rose. By the latter we do not mean an extravagant system of cultivation, but a frequent attention to their needs. Once a week the soap-suds from the wash, if applied to the rose-bed, will tell plainly in larger and richer tinted flowers. The liquid waste from the barn-yard, if not too strong, also assists greatly in the quality of the bloom; but all this is well known, and has been preached rather than practiced for very many years. The few cultivators who do follow this line of action "verily have their reward."

It is a difficult task for our plants to bloom freely and well and at the same time perfect a heavy crop of seed-pots. The last, as is well known, being the strongest drain upon a plant's constitution that it is called upon to perform. Therefore, cut off the dead and decaying flowers as soon as they have passed their prime. Better have fewer plants and then take good care of them.

Dust snuff over the green-fly when festooning the young twigs and sapping their very life away; use soot and air-slacked lime on the slugs, and preserve a deep green luxuriant foliage, as this is next in beauty to the flowers themselves.

Old-fashioned Vines.—Do not turn the deaf ear nor the cold shoulder to the old-time favorites, because the newer candidates are having their praises sung with a golden, yet fictitious value, that nearly takes our breath away. The *Morning-glories*, and *Cypress-vines*, and *Barclayanas* are just as handsome now as ever they were, and will give us just as much pleasure as before the "novelties" were thought of. We do not wish to deter our gardeners from testing new plants, but we do dislike to see the old-time favorites entirely discarded to make room for—we know not what. Let us see the old trellis and arbor still devoted to the above, so that we may recall the good old times when our minds were receiving their first lessons in a love for flowers.

Hedges and Hedge Rows.

MR. EDITOR: Under the above heading in your March number appears the following: White Willow and Osage are well understood to be of local importance, but of no general value. Of one thousand Osage hedges it would be difficult to find ten that do not look like brush heaps. It is a vile ferocious plant more dangerous to man than to animal. Such denunciation of the leading hedge plant of to-day is really distressing, and the statement must only show the local knowledge of the writer in regard to this plant. Does not the fact of the millions of Osage plants which are sold every year to planters in most every state, proclaim its general worthiness? The demand far from decreasing is on the increase, and nurserymen say the supply will not be large enough this year. If the above author will take a look at the farms in Illinois, Indiana, Ohio, Missouri and others, he will find thousands of beautiful living Osage hedges quite distinguishable from "brush heaps." But they need care as well as others, and when rightly treated they make a very ornamental hedge. As for turning animals its reputation is too well established to need argument. I will agree with your correspondent in its being dangerous to man, especially to those light-fingered men who visit their neighbors' corn fields, melon or pumpkin patches, etc.

F. S. P.

Weigela Hortensis Nivea.

THE *Gardener's Monthly* says of this new Weigela:—There has been no novelty of late years, that we deem likely to be of a more lasting popular character than this. The flowers are white—not the white of so many things, that are neither green, nor yellow, nor rose, or a pale edition of some one of them, but a real pure snowy white. The common Weigela rosea, and W. amabilis are well known, as are also the varieties between them, of which probably the best one is the var. Grœnwegenii, which has a very bright rosy tint, and the flowers in immense profusion on long wand-like branches. The history of the present one is unknown to us. It is probably a cross between W. amabilis and W. rosea, or it may possibly be a mere seedling from A. amabilis alone. It has more of its character than of the other one, including its tendency to bloom in August and September, as well as in June. It is not so straggling in habit, but is a well formed bush as is the W. rosea. It came to American nurseries under the name of W. hortensis nivea or snowy white Weigela of the gardens, which seems to indicate that its precise origin is unknown.

It has been found a capital plant for Winter forcing, where pure white flowers are desirable. It moves very well in the Fall, and blossoms as freely as if not transplanted, while a very moderate heat brings out the flowers. These are good points in a forcing plant.

Pole Beans without Poles.

J. B. ROOT, of Rockford, Ill., tells in his *Garden Manual* how he succeeded last year in raising Lima beans with poles. One-fifth of an acre was planted in hills, six seeds to each, eyes down, and when the runners were three feet high and straightened up, the tips were nipped off, thus inducing prompt development of all blossoms, and a set of side shoots which clung to each other and formed a sort of cone.

No more pinching in was practiced for fear of too late a growth. The result was the plants seemed content with a less stature, and a large proportion of the settings matured. The crop was fully one-half greater than ever before, and more than a half greater than that on poles the same season.

Hereafter he will confine himself to this method, with the difference that a lath, set deep, will be used for each hill. This will furnish something for the cone to cling to in a wind and the top of the lath will be a good point at which to nip the vine. It is added that if the crop is raised for ripe beans there should be several pickings, as some of the pods touch the ground and in a wet time the beans become stained. While others are advised, on the strength of this experience, to try the plan, it is "recommended that with this as with all new things, to 'hasten slowly,' and never risk an entire crop on an experiment."

Pinching Raspberries.—The past season I pinched off the top end of a part of my raspberry bushes when they were about three feet high, for the purpose of making them grow slowly, and to spare the trouble of setting poles to tie them to. Those canes pinched off threw out side branches, and the yield of fruit is about double this season on the bushes which were shortened in the last season, in comparison to those which were left to grow naturally. As the currant worm has destroyed nearly all our currant bushes, we can easily supply their place in our garden with other small fruits, such as strawberries, blackberries, raspberries and berberries, which as yet have few insect enemies. The best dressing I find for raspberry bushes is decayed chips or rotten wood from the forest, and ashes. In my berrying days of childhood I always found the largest raspberries and most thrifty bushes growing around rotten logs and decayed stumps in the pastures.—*Cor. Maine Farmer.*

THE mushroom crop in Angelsby was so heavy this season that for three days the London and Northwestern Railway Company were obliged to run special trains for the conveyance of the crop to the English market.

Fruit Culture.

Cherries.

An Address Delivered before the Michigan State Pomological Society.

BY HENRY S. CLUBB.

THE cherry, although long in coming into bearing, requires so little outlay for labor and is so sure a crop, in this climate, that no fruit-grower should think of planting a fruit farm without planting a good proportion of cherries, because while peaches, pears, plums and even apples sometimes fail, the common Morrello cherry, and probably some other varieties, when once in bearing, become as reliable as the commonest farm crop.

Value of the Cherry.

The season of the year when the cherry is ready for market greatly enhances its value as a market fruit, and indeed as a family fruit. It is the first tree of fruit that ripens in this climate, and for cooking it has positively no successful rival among the small fresh fruits of this season of the year.

But the value of the cherry as a fruit for domestic use, as an article of food, and consequently for market purposes, although great, is perhaps only exceeded by its great value medicinally.

In our climate, notwithstanding its salubrious character, persons are sometimes affected with throat difficulties. Perhaps these difficulties are chiefly inherited from our more eastern progenitors; but from whatever cause, the difficulties exist. Our clergymen and others engaged in public life are especially liable to diseases of the throat and consumption, although these diseases are not so common as at the East. The cherry is admitted to be one of the best antidotes, and, perhaps, the very best furnished by nature's great laboratory. The "Cherry Pectoral" of a famous eastern physician has an immense demand, and it is owing to the efficiency of this antidote, which we may have so abundantly if we only take the necessary pains to raise cherries. If cherries were grown so plentifully as to become the daily food of the people, there would be little occasion for expensive "Cherry Pectoral;" the throat diseases would probably be prevented, and the hereditary tendency in a great measure overcome.

The demand for cherries in the season is always greater than the supply; and, even when dried, the cherry commands several hundred per cent. more per pound than any other dried fruit, not excepting the best imported fruits. This shows that there is an intrinsic value attached to the cherry which no other fruit is known to possess. Both its agreeable alimentary and its valuable medicinal properties, we presume, produce this demand and places this high price on the cherry of commerce.

A recent invention for stoning cherries removes the only objection to this fruit as an article of great commercial value.

Varieties.

Of the twenty varieties of cherries mentioned in the appendix to the report of the Michigan State Pomological Society of 1871, only four or five have been proved profitable for market purposes in Western Michigan, so far as my observation and experience extend. While I would not recommend the extensive planting of varieties that have not been proved profitable, it is not amiss to have a few of the choice kinds for experiment. It is, however, with cherries as with strawberries and some other fruits, the strong acid varieties are the most prolific, the surest bearers, and, for market and domestic purposes, the most profitable.

The choice, sweet cherries, although very desirable as table fruit, are not, in my experience, a very sure crop, and being subject to the depredations of the birds are seldom profitable, while the acid varieties are regularly good bearers, and, being almost free from the attacks of the birds and boys, generally remain on the tree until gathered. When thoroughly ripe they are of very rich flavor.

The Early Purple Guigne appears to have become the favorite variety in the southern portion of Michigan's fruit region, and its early and regular bearing, and its good flavor, renders it an excellent and profitable variety. Of the sweet cherries I presume it is the best

that can be cultivated profitably in this region of the State, so far as ascertained.

The Early White Heart is a small sweet cherry, valuable for its earliness, but not desirable for extensive planting on account of its smallness.

Kirtland's Morrello is a short stocked variety, but I have failed to discover any superiority in it over the common Morrello. In fact, I do not find it as sure a bearer. One objection to it is the smallness of its leaves; a serious defect in a climate subject to early, scorching sun. The fruit forms before the leaves protect it, and the sun scorches the fruit, stunting its growth and causing a loss of a large portion of the crop.

One advantage of the Morrello cherry over all others, I think, is its adaptability to a northern aspect. It will flourish in almost perpetual shade, and can be planted on the north side of a hill, wall, house or barn with decided advantage.

The Report of the Department of Agriculture for 1867, describes several varieties of cherries not mentioned in the list of our Society just referred to. Of these the Kirtland, just mentioned, is one, and the Arch Duke another. The latter he describes as the best of the two Duke cherries. I presume the Late Duke, mentioned in the Society's list, may be the same variety, but Mr. Elliott claims that as incorrect, as it bears early in July, and cannot be called a late variety. The Arch Duke is described as large, round, heart shaped; compressed; dark, shining red; stem long and slender; flesh light red, slightly adhering to the pit; tender; sub-acid, rich and very good; tree vigorous, healthy; upright grower with long, broad, oval dark rich green foliage, slightly serrated, and the petioles a little bronzed. In sections where the more tender class of sweet cherries fails to succeed, this variety supplies a want, and offers superior claims to cultivation. The true variety is somewhat rare, as the common Late Duke is often sold for it. From this description I think the Arch Duke would be a very desirable variety for this region of country. Its dense foliage would aid very much in securing the perfection of the fruit in our usually dry June season. If any present have this variety, I would like to hear a report on it.

The Ohio Beauty is another variety spoken of by Mr. Elliott, not mentioned in the Society's list. It is described as large, round, obtuse, heart-shaped; sometimes nearly round; suture slight; color yellow, light ground, mostly overspread and somewhat marbled, with dark rich and pale red spots; stem rather long and slender, and set in a deep open basin; flesh yellowish white, tender, juicy, delicate, with a rich, fine, sprightly flavor; pit small, oval; season last of June. Tree healthy, hardy, vigorous, rather a short-jointed grower, forming a round open headed tree; comes very early into bearing, and produces abundantly. Originated by Mr. J. P. Kirtland, of Ohio, in 1843. Mr. Elliott states that, as far as he could learn, it has proved superior to the claim made for it by its originator. In no place that he could learn of has it ever shown any sign of disease, and it is reported as being grown successfully where the Black Tartarian and Elton have failed. I should judge from description that the Ohio Beauty would be a valuable acquisition to the varieties of the Michigan Lake Shore region, and recommend its trial. It is so large that it would, as a light-colored cherry, be greatly preferred to the White Heart; and its leaf, although not so large as desirable, is perhaps sufficiently large for all necessary protection.

Since preparing this essay I have had an opportunity of consulting Downing's "Fruits and Fruit Trees of America," and find my views confirmed in several particulars.

Mr. Downing insists on the position that the sour cherry is the surest crop:

"The hardiest cherries are the Kentish (or Early Richmond), the Dukes and the Morellos. These succeed well at the farthest limits, both North and South, in which the cherry can be raised, and when all other varieties fail, they may be depended on for regular crops."

The Cherry for Canning.

Mr. Downing says:

"When canned they retain their character

and are very delicious. The Dukes or Morellos are best for the purpose."

Soil and Climate.

The light sandy soil of our Lake Shore region appears to be peculiarly adapted to the cherry tree, and the cool climate of the Lake Shore is peculiarly a cherry atmosphere. I should prefer shade and protection from too much sun as a general thing for producing perfect cherries; as the slower in arriving at maturity, the larger and better is the fruit.

The planting, pruning and cultivation of the cherry differ but little from those of the peach, and no special directions are needed to a society composed of peach-growers. The cherry is so much at home in Michigan that nothing but ordinary care and culture are necessary, and no tree, perhaps, suffers so little from neglect as the cherry. It will grow on the roadside, on the lawn surrounded by grass, or anywhere where an ordinary maple tree will grow, and thrive as well.

The Cherry for Shade.

For ornamental purposes and for shade, the cherry is superior to almost any other fruit-bearing tree. Its beautiful and graceful form; its early sheet of white blossoms covering it as with a mantle of snow; its dense green foliage which soon follows the fall of the blossoms, and then its beautiful pendent fruit in red or jet clusters, nestled in delightful contrast with the emerald foliage, what can be more charming to the eye or more provocative of appetite? Had the forbidden fruit been the cherry, I think Eve herself should be forgiven for her transgression. What boy or girl can resist the temptation to take the cherry as it hangs in all its beauty and glory? The question of ownership is forgotten in the presence of a cherry tree laden with its rich and luscious ripe fruit. This very temptation is used as an argument against planting the cherry as a shade tree along our highways. Beauty so transcendent, as in the human form, should be its own protector. I would like to see cherry trees so common that there would be enough for boys and girls, birds and insects, and yet leave ample for profitable marketing.

It may be asking too much of fruit-growers to plant for the good of the public; but as shade trees of maple and other forest trees are generally quite as costly as cherry trees, and no more easily grown, there seems no serious objection to planting the cherry for shade along our streets and highways, securing for them all the protection that law and police regulations can secure. The sour varieties, although almost as beautiful, would be less liable to depredation than the sweet, and could be planted, I think, without fear of serious injury by boys. They might be alternated with maples with very pretty effect.

Mr. Downing's views on this subject are expressed as follows:

"The larger growing sorts of black cherry are the finest of all fruit trees for shade, and are, therefore, generally chosen by farmers, who are always desirous of combining the useful and the ornamental. Indeed, the cherry, from its symmetrical form, its rapid growth, its fine shade, and beautiful blossoms, is exceedingly well suited for a road-side tree in agricultural districts. We wish we could induce the planting of avenues of this and other fine-growing fruit trees in our country neighborhoods, as is the beautiful custom in Germany, affording ornament and a grateful shade and refreshment to the traveler at the same moment. Mr. Loudon, in his Arboretum, gives the following account of the cherry avenues in Germany, which we gladly lay before our readers:

"'On the Continent, and more especially in Germany and Switzerland, the cherry is much used as a road-side tree; particularly in the northern parts of Germany, where the apple and pear will not thrive. In some countries the road passes for many miles together through an avenue of cherry trees. In Moravia, the road from Brunn to Olmutz passes through such an avenue, extending upwards of sixty miles in length; and in the autumn of 1828, we traveled for several days through almost one continuous avenue of cherry trees from Strasburg by a circuitous route to Munich. These avenues, in Germany, are planted by the desire of the respective governments,

not only for shading the traveller, but in order that the poor pedestrian may obtain refreshment on his journey. All persons are allowed to partake of the cherries, on condition of not injuring the trees; but the main crop of cherries, when ripe, is gathered by the respective proprietors of the land on which it grows; and when these are anxious to preserve the fruit of any particular tree, it is, as it were, tabooed; that is, a wisp of straw is tied in a conspicuous part to one of the branches, as vines by the road-side as in France, when the grapes are ripe, are protected by sprinkling a plant here and there with a mixture of lime and water, which marks the leaves with conspicuous white blotches. Every one who has travelled on the Continent in fruit season must have observed the respect that is paid to these appropriating marks; and there is something highly gratifying in this, and in the humane feeling displayed by the princes of the different countries in causing the trees to be planted. It would indeed be lamentable if kind treatment did not produce a corresponding return.'"

The Cherry as Timber.

As a timber tree the cherry ranks high. It is in value and richness next to our famous black walnut, while its growth is much more rapid. The desk on which I write is made of Michigan cherry; the household furniture next best to black walnut and mahogany is made of Michigan cherry and thence transported to all parts of the world; the best printers' furniture made in New York, Boston and Cincinnati is manufactured from Michigan cherry, and distributed from thence wherever civilization has carried the printing press. Cherry, as grown wild in the woods of Michigan, is sought for by the manufacturers of school furniture in Chicago, Boston, and New York, as the best wood they can find for their purpose. It is easily worked; receives a good polish; has a delightful lively color, and, in contrast with maple and walnut, gives a pleasing variety of color to our decorative cabinet or carpentry work which, of late years, have introduced a new charm to dwellings, offices, stores, railroad cars, steamboats and private carriages. The wood is hard without being coarse or knotty, and its grain, though not prominent, is fine and beautiful.

The Gum.

There is nothing in connection with the cherry which is not of interest and value. Even the gum which exudes from its wounds is precious for medical purposes, and makes an excellent mucilage of daily value in every office, library, or sanctum.

A Universal Blessing.

In every position of life the cherry contributes in some way to the comfort, enjoyment and service of man; its wood is used to form the cradle of infancy; the chairs, tables, bedsteads, bureaus, desks, and cabinets of mature years, and when our time of final transport to another world arrives, it commonly forms the final casket of our mortal remains. The fruit is the first to tempt our youthful appetites, for who has not stolen cherries in his boyish days? It forms the most showy fruit in the market at any season of the year, only equalled by the precious strawberry; it makes unquestionably the best canned fruit in the market, as no fruit preserves in the can its flavor and its color like the cherry; as a dried fruit it has no equal in the whole realm of commerce; for the table and for pastry, the cherry cannot be excelled; for wine it is nearly equal to the grape itself, while its curative properties are universally conceded, and creates for it a universal demand. Whilst therefore it gives pleasure to youth, it comforts the aged and relieves the afflicted; whilst its rich color is the acknowledged standard of beauty on the lips of the most charming of womankind.

Need I say more for the cherry? Do not mistake me as claiming that the cherry is the panacea for every ill and the fountain of every blessing. I simply claim for it a prominent place among the fruits of our favored country, and thankful and proud should we be that we live in a land and enjoy a climate where this fruit can be grown so easily, so cheaply, and so abundantly.

Window Gardening.

Window Gardening.

Read before the Maryland Horticultural Society,

BY J. EDWARD FEAST.

The subject for discussion, this evening, is Window Gardening, which interests all lovers of flowers, principally those amateurs who have not the means to build greenhouses, conservatories, etc.

To encourage and foster the taste for Window gardening should be the aim of all florists, not only for its pecuniary benefits but for the influence it has on every household—as it tends to elevate the mind and make home attractive and pleasing both to young and old—as Williams, in his "Window Gardening," expresses it: "Flowers are a spring of sunshine, a constant pleasure; we would have flowers in every home for their sunny light—for their cheerful teachings—for their insensibly ennobling influence."

The three principal things required to grow plants successfully are light, air and moisture. Light is one of the most important agents in the growth of plants, it strengthens the color and matures the growth of both wood and flower—place the plants as near the glass as possible.

Windows having a southern aspect are the best.

Judicious watering is perhaps the most important feature in their management; the best and only general rules which can be adopted, are in winter, keep plants (not then growing) rather dry—in spring, increase the quantity with their activity and the sun's powers, keeping them in a medium state. In summer give water in plenty—and in autumn, decrease the supply with the approach of winter—in fact, never water a plant without it is dry, and then water thoroughly that the soil may get wet to the bottom of the pot—and empty all refuse water in the saucer.

Give *air* every fine day and avoid a draught.

To grow plants with credit in a window they should be screened from the dry air of the room, either by a curtain or an inside window, as the gas and dust is injurious to the delicate construction of the leaves.

Cleanliness is also essential by syringing, and sponging the leaves—and keeping the plants free from insects.

Keep the temperature of the room as uniform as possible, not lower than forty-five degrees at night and sixty and seventy-five during the day; in severe weather remove the plants from the window to secure from freezing, as it injures them even to be chilled, and takes some time to recover from the effect.

There are a great many designs now manufactured, for the window gardener to choose from, or to gratify his or her taste, viz.:

The window pots, boxes, jardiniers, plant stands, ferneries, hanging baskets, wardian cases, Etageres, mantle piece gardens and other designs of a great variety; but a plain box fitted to the window sill and filled with foliage and flowering plants, with English Ivy and other vines, trained over the window, surpasses them all in beauty and simplicity,

A glass case projecting beyond the window sashes on brackets, with a lean to roof, and filled with ferns and flowering plants are very popular in England; nearly every household has one of some shape or another, as I have been informed by a lady lately returned from London,

The best display of window flowers in Baltimore, are raised and attended to by a lady, a member of this society. They can be seen at any time on Cary street, near Franklin square, which are the admiration of all passers, as the flowers are so attractive no one can resist the temptation to stop and *admire*. With a little attention every day any person can have the same.

The most suitable plants for a window, facing the north, where they receive little or no sun are the following;

The common English Ivy, the easiest of all vines to cultivate for indoor use, and which adds more grace to the window than any plant yet used—it will grow both in the shade or sun.

Smilax, another graceful vine, answers best for winter, as it dies down in summer—all

kinds of temperate ferns, such as Nephrolepis exaltata—Lomaria gibba—Alsophylla australis—Pteris argyrea—Doryopteris pedata—Pteris cretica liniata—Phlebodium aureum—Adiantum cuneatum—A. affinne—A. microphyllum—Acrosticum alicorne—Lastrea cristata and Selaginella Wildenovi.

Dracæna terminalis and D. Braziliensis—always ornamental—Maranta zebrina—Sanseviera—Echeverias—Sago palm—(Cycas revoluta)—Ardisia, Solanums, and the following flowering plants: Camelias, Daphnes, Myrtles, Lily of the valley—and for the summer: Gloxinias, Achimenes, Alocasias and Caladiums—for hanging baskets nothing is prettier than Sedum Sieboldtii, Cordyline vivipara Musk plant, Tradescantia, Saxifragras, Lysimachia or Moneywort.

Plants for an eastern, southern, or western exposure—Oxalis, Chinese primroses, both double and single, all kinds of succulents, including the Cacti, Fuschias, Petunias, Pelargoniums, Carnations, Geraniums all kinds—Azaleas, Mignonette, Tropæolum, Pinks, Ferns, all the Ivies, Marantas, Dracæna, Begonias, both foliage and flowering—especially B. Saundersonii, B. Weltoniensis, B. Weltoniensis alba, B. hybrida multiflora, B. parviflora or Dregeii, and B. nitida or semperflorens alba. Amaryllis, all the varieties, Cyclamen persicum, Caladiums, Callas, or Richardia, cineraria, verbena, bouvardia, mahernia or Hermanneria odorata, hoya carnosa (the wax plant), lantana, especially lantana elegantissima or Sellowiana a free flowering fall and winter variety, echeverias, liliums in variety, tritelejas, a pretty star shaped flowering bulb—ixias, sparaxis and all bulbs known as Dutch bulbs.

Vitis or cissus discolor, for summer is a splendid climber for the window—also passiflora trifasciata—both have beautiful foliage.

For hanging baskets, Convolvulus Mauritanicus, lobelia gracilis, ivy leaved geraniums, ivies, begonia rex and its species, caladiums, dracæna terminalis, mesembryanthemum sedums, senecio scandens or German ivy, pilogyne suavis, marantas, othonna crassifolia (a new basket plant) is quite an acquisition, begonia glaucophyllum scandens, also a new plant, will be in demand both for basket and vases.

Pansies massed together in boxes are pretty and effective.

Forget-me-not (myosotis palustris) cut and placed in a glass of water "shaded," and the water changed three times a week, will grow and blossom the same as if planted in the earth.

Ferneries filled with choice ferns, which are dwarf in their habits, overrun with Lycopodiums and Selaginellas, require very little attention after being filled. For outside window or balcony decoration have a box of rich sandy soil prepared and planted with either of the following vines: Cobea scandens, thunbergia, English ivy, tropeolums, Cissus discolor or maurandia and Mignonette, phloxd rummondii, sweet alyssum, nemophyllas, salvia splendens, interspersed with foliage plants, a box sown with the common portulacca, when exposed to the sun, and when in blossom, is dazzling to the eye.

Also in conjunction with house plants and ferneries, goes also the aquarium, or river garden.

By the culture of some of our most beautiful fresh water plants in glass aquariums many of the wild beauties of nature in some of her most pleasing and interesting forms may be wrought into attractive decorations for our ordinary rooms, with very little trouble and expense; but this is not the chief object of such aquaria. Their formation has been suggested by the discovery that the growth of aquatic plants will keep the water contained in such a vessel in a state of purity, sufficient for the healthful existence of all kinds of animal life, of which water is the natural element. It is well known by chemists that plants immersed in water when exposed to the action of light, emit a gas known as oxygen. The knowledge of this principle, is the basis which governs us on the construction of the aquarium, together with the assistance of water snails, who act as scavengers in purifying the water.

In preparing an aquarium, it is requisite, that the paint and cement should be perfectly

dry and entirely free from any unpleasant smell, which would be fatal to many of the animals, if not even to the plants also; use only clean washed sand. Some plants, however, such as water lilies, "Nymphæ odorata," etc. do better with a layer of fresh earth under the sand, and artificial rock work projecting above the water, and planted with ferns and forget-me-nots, have a good effect.

When the aquarium has been furnished with its plants and fish, also with snails to consume decaying vegetation, and at the same time to furnish a large number of eggs to nourish the fish in the tank—it becomes a beautiful ornament for a room and especially for a study. The vessel must however, above all things, be placed where it will receive a sufficiency of light, for without that life-giving influence, neither the aquarium nor even the natural lake itself, could carry on its interesting processes.

Light and air are essential for animal and plant life.

Plants for both Garden and House.

BY ANNE G. HALE.

SEVERAL species of garden flowers will bear transferring in the autumn to the parlor, and when providing plants for summer growth, out doors, it is well to make arrangements for rearing some that will lend their beauty in doors during the winter. The first that suggests itself is the Verbena, so extensively used as a bedding plant. Early in the spring assorted baskets of these favorite flowers, just ready to bloom, may be obtained at the florist's. We shall find them scarlet, purple, crimson, pink, white, lilac, in plain colors, striped or mottled, with eyes of the same, or of different hue; and nearly every garden and door yard will have its verbena-bed, square, oval or circular, flat or convex, keeping up a blaze of beauty until late in the fall. Now, these are very handsome, and worthy good care and attention; but they will not do for winter blossoming. They are generally raised from cuttings and exhaust their blooming powers the first season; the best winter verbenas are raised from seeds. Get the seeds of a florist, prepare a bed of sifted sandy loam, scatter the seeds upon it, sift enough of the same loam upon them to cover them well and spread over the bed an old shawl or a blanket, fastened at each corner by means of weights or heavy stones. Let it remain thus a few days—until the soil is cracked by the starting seeds. The bed should be in a sunny place; verbenas need plenty of light and heat. Sow these in May; June is not too late however, and after three weeks' growth remove all puny looking plants. Let the first buds open and decide then what varieties will be most desirable for winter flowering; these should be labelled, and, thereafter, all buds cut out as fast as they appear, and the plants pruned and cut to form shrubs. Plants not desired for winter may be allowed to grow and bloom as they please. Verbenas for winter blooming should be potted early in October; rich sandy loam with a little leaf mould is the soil for them, and kept in a cool room one month before taken to the parlor. Seedling verbenas grow stouter and stronger than those from cuttings, bloom more profusely, and are generally more healthy than they are when living within doors.

The Petunia that grows as easily as a weed, in any garden earth, is yet a very lovely plant for the parlor, and adds much to our window display through the winter. By careful culture it has been much improved during the past ten years; its original colors of dingy purple or white have been cleared and brightened, and now we get them from the darkest royal purple, and clear crimson, to pink, violet and white, self colored, or mottled, striped, veined or blotched; and its trumpet shaped flowers lend an air of elegance to any location.

The double varieties are raised from cuttings, are of rather delicate habit, but the natural form, single corolla, is the best for garden growth; and, though it may be multiplied indefinitely by cuttings, like the verbena, seedlings are more sure of producing abundance of bloom. The mode of planting, sum-

mer treatment, and preparation for winter life should be the same as for seedling verbenas, except, if any varieties seem determined to trail, keep them for basket plants; the same should have been said of verbenas; cultivated in that manner they will put forth more blossoms than if trained to a trellis.

The Salvia, especially *Salvia splendens*, after its autumn flowering should be transferred, to the parlor. Seedlings must be pinched often to make them grow shrubby and strong. Pot them in October, and accustom them gradually to the indoor atmosphere. They need rich loose soil and plenty of sunshine. Old plants after blooming must be cut back two or three joints on all branches; they will then throw out new shoots tipped with their elegant scarlet bracts.

Stocks.—Stock gilliflowers, as they are usually called, seldom blossom till the second year, but if potted in the autumn their lovely fragrant flowers will open by January, and continue in bloom till warm weather. The most desirable are the German stocks; a package of seeds will furnish a large supply of plants in deep crimson, pink, red, lilac, purple and white. Sow them like verbenas, and throw away all slender plants when two or three inches high. Give them rich soil; in poor soil, double stocks return to their original type, single and meagre. When taken to the house keep them two or three weeks in a cool room before carrying them to the parlor.

The Canna—Indian Shot, is its familiar name, so called because its shining black seeds have been used for shot by the East Indians; is easily cultivated either for garden or indoor flowering. The seeds are hard, and do not germinate readily unless they are softened by pouring hot water upon them, and soaking them twenty-four hours previous to planting. The best way to plant cannas is to make a shallow trench in rich mellow soil, place the seeds in this about a foot apart, and then sift moist soil upon them to the depth of nearly two inches. They need plenty of sun. This plant, with its elegant large leaves, is a fine ornament for any grounds; and when its slender spikes are crowned with lily-like flowers of brilliant scarlet or orange, it is greatly admired. Cannas seldom bloom the first season, or not until very late, and usually they are stored through the winter in the cellar, and bedded out the following summer. But they evidently prefer society to solitude, for, if potted in the autumn and taken to the window garden, they send up their blossoms in January and February as gaily as any of their companions.

Primula Chinesis, the Chinese Primrose, with its handsome and curious leaves and lovely flowers is always desired as a parlor plant, and its seeds sown in the garden in May or June will bloom in the autumn. From a package of seeds may be obtained a number of plants yielding double blossoms; but the single ones are very beautiful and fragrant. The primula is frequently propagated by division of its root. Those plants, however, do not bloom so freely as seedlings. Sow the seeds in sandy loam, where they will be sheltered from the noonday sun. In September pot them in the soil of leaf mould, loam and sand, in equal proportions; take them into the house, but keep them cool till the middle of October, then they may have a place in the parlor. When primulas, especially the white varieties, have expanded their first blooms, they will retain their beauty longer, by denying them sunshine; they should have a place near the window that they may get a great deal of light, but no direct sun.

Mignonette grows finely indoors, and when planting it in the garden, reservation should be made for raising a few plants for the winter. From these plants pinch off every appearance of bloom as soon as noticed, also trim off the lower branches. In September pot these plants, give them light rich soil, and take them within doors. By December, they will throw out flower spikes, whose modest blossoms will fill the house with fragrance. The plants will continue to send forth new flowers as fast as those in bloom are removed. The pretty Sweet Alyssum should be managed in a similar way. It makes a fine creeping and trailing plant for baskets, and blossoms profusely.

Editor's Portfolio.

Scene in a Buddhist Garden.

The illustration contained in our frontispiece, introduces to us a curious phase of Indian garden scenery. In the foreground is a noble Talipot palm (corypha umbraculifera), the leaves of which are used by the Buddhist monks, prepared in small narrow strips as books in which to record their sacred writings. The leaves of this palm are used also as umbrellas and sunshades, and everywhere the custom is universal to use them for covering huts and making temporary tents. It is the noblest of the palm family, growing to the height of one hundred feet frequently. It only flowers once and then dies.

A correspondent of the *London Gardener*, in writing of it, says; "I saw a noble grove about three years ago all flowering at one time; they had a truly grand appearance, and would produce some thousands of seeds."

At the left hand, is the sacred "Bo tree" (Ficus religiosa). Every temple has one of these in its vicinity; part of the ancient tree at *Andro japoora*, which was originally planted there by Buddha and his followers, and said to be one of the oldest trees in the world. The temples are also always located near abundant water, and the vegetation is rich beyond description. With regard to the interest of the Buddhist religion in horticulture, Tennant's history of Ceylon says.:

One peculiarity in the Buddhist ceremonial served at all times to give a singular impulse to the progress of horticulture. Flowers and garlands are introduced in its religious rites. to the utmost excess. The atmosphere of the wehara and temple is rendered oppressive with the perfume of champac and jessamine, and the shrine of the deity, the pedestals of his image, and the steps leading to the temple are strewn thickly with blossoms of the najaha and the lotus. At an earlier period the profusion in which these beautiful emblems were employed in sacred decoration appears almost incredible; the Mohawason relates that the *Ruanwelli dagoba*, which was two hundred and seventy feet in height, was on one occasion festooned with garlands from pedestal to pinnacle, till it resembled one uniform bouquet; and at another time, it, and the lofty dagoba at Mehintala were buried under heaps of jessamine, from the ground to the summit.

The various kings in succession formed innumerable gardens for the floral requirements of the temple. The capitol was surrounded on all sides by flower gardens, and these were multiplied so extensively, that according to the rajaratnacari, one was to be found within a distance of four leagues in any part of Ceylon. Amongst the regulations of the temple built at Dambenia, in the thirteenth century, was, "every day an offering of 100,000 flowers, and each day a different flower."

Another advantage conferred by Buddhism on the country, was the planting of fruit trees and esculent vegetables, for the gratuitous use of travelers in all the frequented parts of the island.

On the rocks and monuments of India are edicts from the kings to their successors to merge the good work. One of their edicts, by the king of Magadha in the third century, B. C., commanded that "everywhere, wholesome vegetable roots and fruit trees shall be cultivated, and that on the road wells shall be dug and trees planted for the enjoyment of men and animals.

Wine Culture in Italy.

The growth of the vinicultural interest in Italy during the last few years has lately manifested itself by remarkable results. At the London Exposition in 1862, of one hundred and thirty kinds of Italian wine exhibited, forty-five received premiums. At the Vienna Exposition of 1873, of two hundred and thirty Italian wines exhibited, one hundred and one either received a premium or an honorable mention. Italy devotes over 6,000,000 acres to vine culture, producing, in 1873, over 870,000,000 gallons of wine. Of this amount about 250,000,000 gallons are credited to Naples and Sicily; 200,000,000 gallons to Emilia, Umbria and the Roman marshes; 200,000,000 to the older provinces. The average

price, as officially estimated by the Italian statistical authorities, was about nineteen cents per gallon; making the total value of the wine product about $165,000,000. The value of exports of Italian wine rose from $2,799,696 in 1871, to $4,692,672. France takes the largest proportion of this export; next in order, England, Switzerland, Austria and the United States. Egypt takes a large quantity in bottles, while considerable quantities of bottled wine are shipped to Tunis, Tripoli, Brazil and Holland.—*Ag. Depart. Report.*

Ancient Oaks.

The *Antiquary*, an English paper, describes an oak felled at Newport 28½ feet in circumference; the timber sold for $3,350, and the bark for $1,000. The Parliament oak in Chepstow Park is supposed to be 1,500 years old. Edward I held a parliament beneath its boughs. The "Duke's Walking Stick," at Welby Abbey, is an oak 112 feet high. The Greendale oak has a spread of 700 square yards, and a carriage-drive is made through its partly decayed trunk. The largest oak in the world is supposed to exist at Calthorpe, in Yorkshire; its trunk is 78 feet in circumference.

Herstine Raspberry.

The Herstine, in the same spot that the canes were killed a year ago, are now sound, with the exception of about twelve inches of the tips—a part where, possibly, the wood was not ripe. The Philadelphia, growing in the same place, between rows of pear trees, are unharmed by the effects of the cold weather, while those in the open field are nearly all dead. The Herstine is a much firmer and better quality berry than the Philadelphia, but whether it will prove hardy in a wide range of country has yet to be decided.—*P. T. Quinn.*

Remedy Against Moles.

The *Gardener's Monthly* says: Tow dipped in gas tar, buried in their runs, will drive moles away.

Gigantic Trees in Mexico.

One of the noticeable sights about Chepultepec, Mexico, is the grove of gigantic cypresses, said to be from 1,500 to 2,000 years old, with trunks scarred by shot and shell, fired in the many battles that have taken place in the immediate neighborhood. On top of the rock is the old Spanish castle, built of porphyry, marble and sandstone.

Profit of Fruit Growing in California.

A new fruit is attracting attention in California, the *Prune*, of which extraordinary profits are believed possible to realize. The Alden Fruit Preserving Company say in their pamphlet: "At fourteen feet apart, two hundred and twenty-two trees may be planted to the acre." The writer has seen trees of the Petite Prune d'Agen (an excellent variety) five years old from the bud, bear two hundred pounds to the tree. These prunes can be made into an article far superior to any imported prunes, at a cost not exceeding three cents per pound. This would give 15,200 pounds to the acre, of preserved prunes, which, at 20 cents per pound, would give $3,040 per acre, or about $14 per tree. Deduct from this the cost of curing, three cents per pound, or $456 for the product of one acre, less the cost of raising. Those who consider these estimates too high may reduce them one-half, and still it will leave a handsome return for the labor and capital invested.

The Eucalyptus in Mexico.

The *Eucalyptus globulus* has been known in Mexico for many years, and used as a preventive against chills and fever. The three-mile drive, from the city of Mexico to Chapultepec, is bordered by an old avenue of these trees; and wherever there is malaria, there is the Eucalyptus. In view of this fact, the citizens of New Orleans, we learn, have taken active interest in its introduction, and by order of the city council, the Mayor has advertised for sealed proposals for planting it on a large scale in and about the city.

Bananas in Southern California.

In the beginning of 1873, some bulbs of the Banana plant were brought to California and planted near the San Gabriel Mission, in the place of Rev. H. H. Messenger. They were imported from the Sandwich Islands. In

eighteen months from the time they were planted, the stalks blossomed, and three months later the fruit matured; fifteen bananas were borne upon the bunch, they were small, but well flavored. It seems from this, that the introduction and successful growth of this fruit gives no doubt of its permanent introduction to the already famous list of fruit adapted to California's wonderful climate. The Florida Banana, it is believed, would succeed there splendidly.

Nut-bearing Trees.

Greater attention is paid to this subject in California, than here in the East, for we hear frequent mention of successful experiments in culture of nut trees there than any other part of America. In Nevada, Cal., the proprietor of some public gardens obtained from France some of the finest specimens of chesnuts, and planted them on his place in 1870. Although it has been but four years since the trees were planted, yet they have already borne fruit; the trees are described the past year as being heavily loaded with fruit, and the nuts were the largest sized ever seen. The burrs contained from three to seven large sized nuts, some of them exceeding in size a large plum. The climate is admirably adapted to it; and of the almond, thousands of trees have already been planted.

The Fruit Market of San Francisco.

We observe, in the *California Horticulturist*, a report on the Fruit Markets of San Francisco, wherein occur statement of prices which quite amaze us. For instance—

Rhubarb sold at	25 to 37½	cents	per lb.
New potatoes,	6 to 8	"	"
Horse radish,	20	"	"
Field lettuce,	25	"	"
Sun-dried California raisins,	20	"	"
Green peas,	25	"	"

Pine apples, 50 cents to $1.25 each.

Surely this must be a *gardener's paradise*. But we infer these prices were quoted only for the beginning of the season, for we have known green peas sold there for six cents per pound and lettuce at 20 cents per dozen, and asparagus fall from 70 to 7 cents per bunch.

Viburnum Awafurki.

The *California Horticulturist* says that of all the brilliantly colored autumnal plants it has ever seen this is the finest. The leaves turn of a bright rose color.

Raisin-making in California.

In the foot hills of the Sierra Nevadas, near a little place called Rockland (6 miles east) resides Mr. H. B. Allen, who has for several years been engaged in a small way in making raisins. His vine is the Muscat of Alexandria; he sells his product to his neighbors, and readily gets 16⅔ cents per lb. wholesale. As the vines cost but five to six cents each, the land but three dollars per acre, and 1200 vines are usually planted to the acre, and each vine after four years old bears fifteen pounds, the closest estimator will find a total yield of $750 per acre. One would suppose that this "Big Bonanza" of a crop would attract "*millions*," but there are some drawbacks. Drying in the sun is a tedious operation, requires considerable attention and there is some damage from rain; but even these difficulties have been overcome by the irrepressible yankee invention of the *Alden fruit dryer* which dries them with great rapidity in the very best manner, and makes raisins of excellent quality. The best lands suitable for this business are those which have little or no irrigation.

In view of this information which was considered definite enough to warrant general planting, last season General Bidwell of Chico, California, planted in his estate 22,000 acres, 110,000 grape vines of the White Muscat. From some vines in his possession he made some raisins last fall, which were certainly as fine as any Malagas ever displayed there.

A California Prune Orchard.

According to statements in the California paper, the best prune orchard in the world is that of J. M. Patterson of San Jose, California. It contains about 2,000 trees set in rich alluvial soil, 12 feet apart, remarkably thrifty, and produce crops of very superior fruit. The *California Agriculturist* says.:

Last season 600 Gross Prune de Agen trees

produced some twenty-five tons of fruit worth, at wholesale, not less than four cents per pound, or $2,000. The fresh fruit brought, in twenty pound boxes, in New York, twenty-five cents per pound, and in San Francisco was worth, nicely packed in small boxes, from six to eight cents per pound. The same variety of prunes, pitted and dried by the Alden process, were sold here, wholesale, to an eastern firm for thirty cents per pound, and three pounds of green would make one of dried fruit.

There were produced in the same orchard over five tons of the Petit Prune de Agen, a small, very sweet prune, and one in demand for its excellence, These are prized as drying prunes, and will only lose one-half by evaporation. The difference in flavor between this prune and the large Gross Prune de Agen is considerable: the small prune is very sweet, while the large is quite tart for a prune. There were several tons of Damson plums and a quantity of Green Gages and other plums produced in this orchard, all of very fine quality. Every season the fruit is thinned out nearly one-half when from one-quarter to one-half grown, to keep the trees from overbearing. The advantage in this is, the trees are prevented from breaking, and what fruit is left grows to a very large and uniform size.

Mr. Patterson says that there is a difference of two years in the bearing age of plum trees between the budded and grafted trees, the grafted trees bearing two years sooner than the budded ones. This is his experience. Grafted trees four years in orchard, set when one year old, bore ten pounds each. When the trees are eight to ten years old they will bear one hundred pounds to the tree on an average. Ten acres in plums and prunes, on suitable soil, are all that any one family would want or need. It would bring a liberal income every year.

He is offered $2,000 a year for the fruit his orchard contains without further expense to himself than cultivating and caring for the trees. This, on about six acres of orchard, many of the trees of which are too young to bear much.

Weather-telling Plants.

Herr Hanneman, inspector of the Botanical Gardens at Proskau, Germany, has observed that several plants may be used as weather-prophets. Here are some of his observations: Convolvulus arvensis, the common English bineweed, and anagallis arvensis, the English pimpernel, spread their leaves at the approach of wet weather, while the different species of clover contract them. Stellaria media, the chickweed, at nine o'clock in the morning, if the weather is clear, straightens its flowers, spreads its leaves, and keeps awake until noon; if, however, there is rain in prospect, the plant droops, and its flowers do not open. If they open a little the coming rain will be of short duration. The same with pimpinella saxafraga. Calendula pluvialis, the marigold, opens between six and seven in the morning, and keeps generally awake until four in the afternoon. In such cases the weather will be steady; if, on the other hand, it has not opened by seven o'clock in the morning, you may that day look for rain. Sonchus arvensis and oleraceus, the hog-thistles, indicate fine weather for to morrow if the head of blossoms closes for the night; rain if it remains open. Again: rain is certain if hibiscis trionum, the bladder ketmia, does not open its blossoms; if carduus acaulis, the stemless thistle, closes; if clover, and most allied kinds, drops its leaves. Also, if lampsana communis, the nipple wort, does not close its blossoms for the night; if darby verna, the whitlow, grass lets its leaves hang drooping; if gallium verum swells and exhales strongly; also if the birches scent the air. Anemone ranunculoides, the crowfoot anemone, also tells the coming rain by closing its blossoms; while anemone nemorosa carries its flowers erect when the weather is fine, and drooping when overcast.

The Ink Plant.

Some of our botanists are said to be engaged in the acclimatization of a plant brought from New Grenada, which will enter into competition with our ink manufacturers. It is the *Coriaria thymifolia*, or ink plant. The juice which is extracted from it, and which is called "canchi," is at first of a reddish tint, but in

the space of a few hours assumes a hue of the deepest black, and can be used in its natural state without preparation. The merits of this canchi consists in its not affecting steel pens as the ordinary ink does, and besides, it will resist the action of time and the influence of chemical agencies.

New Publications.

"The Pinetum: being a synopsis of all the coniferous plants at present known, with descriptions, history and synonyms, and a comprehensive systematic index, by George Gordon, A.L.S. etc. etc. Second edition." London, Henry G. Bohn.

We have just received a copy of the above work, and in the short time allotted to its perusal, we find many things to praise as well as frequent errors to condemn. It is emphatically a horticultural book, and the scientific botanist who glances through its pages must feel disappointed at the mixed style of its descriptions. Every chance sport from the original type of the various species has been enumerated, and in some instances, with even more exactness than the parent plant itself, which is all very well so far as a guide to the general planter is concerned; but when the author undertakes to settle the disputes that are now current in relation to the American conifers, and upon this horticultural basis too, he commits a grave error.

His experience should certainly teach him, that the length of leaves, and size of cones, are by no means reliable tests of a species, for the reason that many species, such as the *Pinus ponderosa*, vary so widely in these characters, as to be of no account whatever in a scientific classification: when we look over Parlatori's monograph of the conifera, although it can hardly be considered free from inaccuracies, we still notice what a severe weeding out these superfluous species have received.

Guessing should not be tolerated in a book of reference like this, and yet we find a seedling of the American arbor vitæ (Thuja) placed under the heading of *Retinispora*, a sub-genus belonging to the Cypresses (Cupressus). This it strikes us is very careless and mischievous in its tendency. The variety, or rather sport, as it is merely an abnormal form of the species is described under the title of *R. Elwangeriana*, with the additional information that "it is said to be a hybrid (!) production raised in America, but in all probability a Japanese plant."

Another and similar heath-leaved variation from the original type of the American arbor vitæ, known in gardens as *Thuja occidentalis ericoides*, is classified under the heading of *Retinispora* after Carriere, and is called *R. Juniperoides*. Botany must soon become a mass of complicated names, if our authors on trees and plants seize upon every curious freak of nature to inaugurate new species, and even new genera, as is instanced in the last two plants.

As a rule, all conscientious botanists desire to curtail the list of species, where the characters are not well defined, and distincty perceptible. In the "Pinetum," however, we notice so many plants described as species, that are really nothing more than mere variations of a species, and in some instances without sufficient claim to the honor of a well-marked variety, that we cannot pass the matter by without entering our protest *Thuja dumosa, Gordon*, as here described, should have been placed under the heading of *Biota*, as it is nothing more than the dwarf form of the Chinese arbor vitæ.

The form of the American arbor vitæ cultivated in our collections as the Siberian arbor vitæ, is accorded by Gordon the position of a species under the title of *Thuja Tartarica*, notwithstanding he says, "it was originally raised many years ago by Mr. Ware, a nurseryman at Coventry." Unfortunately for the specific claims of this plant, its progeny will return to the original type, i. e. the American arbor vitæ, thus incontrovertibly determining its true position.

We are pleased to observe he has untangled the matted skin of error that was so painfully apparent in a former edition of his work in describing the *Thuja gigantea* and *Libocedrus decurrens*. These two species have heretofore been the bone of contention among many cultivators, owing to the mistakes of collectors who

were not sufficiently acquainted with their true characters.

We again enter our protest against the name of *Wellingtonia gigantea* for the Mammoth tree of California—*Sequoia gigantea.* Mr. Gordon however, remarks by way of apology for his course, "the genus Wellingtonia is considered by most systematic botanists as untenable, it not being sufficiently distinct from Prof. Endlicher's genus Sequoia; nevertheless, as the name has now been universally adopted in garden literature, it had much better be allowed to stand, as its alteration would cause great inconvenience and much confusion in practical botany." Here we respectfully beg leave to differ. Practical botany is just what suffers most from such a course. It should be raised above all minor considerations pertaining to nationalities and preferences; and outside of England, no botanist uses the term Wellingtonia. Our author should not classify among his synonyms of this tree, the term "*Washingtonia gigantea* of the Americans," as American botanists have too true a sense of correct nomenclature, than to use so incorrect a title; and as for *Americanus giganteus*, it is a mere burlesque.

Biota pendula, Endlicher, is not a species but an interesting form of the *Biota orientalis*, as seedlings from it almost invariably return to the original species. *Biota mildensis*, Lawson, is nothing more than an abnormal form of the species having retained its primordial leaves. All the tales about its hybrid relation to the Red Cedar, etc. is nothing more than idle gossip.

Among the silver firs we believe Mr. Gordon has made entirely too many species, adopting as reliable characteristics, the variations that all species are liable to assume, and which should be disregarded in a strict classification. In this connection we have merely to allude to the *Picea Lowiana*, which is decidedly a form of *Abies grandis.*

Pinus Benthamiana of Hartweg is unquestionably a well marked form of the *Pinus ponderosa*, and cannot assume the position of a species, as it is not nearly so distinct as many of the other varieties, especially those bordering upon the region of Pike's Peak, where the trees so closely resemble *P. resinosa* of the east as to be almost unrecognizable.

Pinus Jeffreyi as well, will not stand the test, although its cones are quite distinct in many ways. There must be a limit to these multifarious forms and the sooner we curtail the list, the more readily will cultivators adopt the new order of things. *P. radiata*, especially, cannot assume the position of a species, and we wonder at Mr. Gordon's classification. It is nothing more than *P. insignis* of Douglas.

But with all the imperfections and errors contained therein, the Pinetum is a readable and useful work. To the collectors of conifers, as well as to the general planter, the list of curious and handsome sports enumerated and described, will be found of great interest, as many of these are really more valuable than the specimens themselves; and differ as we may with the author in his classification, still we must award him unqualified praise for his industry and perseverence in collecting such a mass of valuable information in this respect.

We also notice with pleasure an absence of sarcasm in the present edition, that was so conspicuously and painfully apparent in the original work

Many mistakes have been rectified, and several new and good species have been introduced, for all of which the author should receive our thanks The names of the most prominent growers of conifers are alluded to as having rendered assistance in the compilation of the work, men whose lives have been passed among this class of trees, and whose judgment should carry weight. We feel sorry that the already large size of the book should have been increased by the addition of the "Index of Popular Names," as this is composed mainly of translations, which any one could do for himself.

There is also too strong an odor of the *shop* in the lists of conifers presented by several nurserymen. A work of this kind should be something more than an advertising medium for the "trade." EVERGREEN.

THE HORTICULTURIST

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Special Contributions.

A Squash in Harness.

Curiosities of Plant Life.

By Prof. W. S. Clark, from Report of Experiments to Mass. Agricultural College.

WE have attempted to study that most familiar plant, *the Squash*—and the results have far surpassed our most sanguine expectations.

The particular species selected for observation is named *Cucurbita maxima*, and the variety is called, by Gregory, the mammoth yellow Chili. It is said to be a native of the Levant, and to have been introduced into England in 1547. It is sometimes called the French pumpkin, and its fruit readily attains a weight of one hundred and fifty pounds. One has been grown in England, which weighed two hundred and forty-six pounds.

The following considerations suggested the idea of experimenting with the mammoth squash:

First. It is a well-known fact that beans, acorns and other seeds often lift comparatively heavy masses of earth in forcing their way up to the light in the process of germination.

Second. We have all heard how common mushrooms have displaced flagging-stones, many years since in Basingstoke, and more recently, in Worcester, England. In the latter case, only a few weeks ago, a gentleman noticing that a stone in the walk near his residence had been disturbed, went for the police, under the impression that burglars were preparing some plot against him. Upon turning up the stone, which weighed eighty pounds, the rogues were discovered in the shape of three giant mushrooms.

Third. Bricks and stones are often displaced by the growth of the roots of shade-trees in streets. Cellar and other walls are frequently injured in a similar way.

Fourth. There is a common belief that the growing roots of trees frequently rend asunder rocks on which they stand, by penetrating and expanding within their crevices.

Having never heard of any attempt to measure the expansive force of a growing plant, we determined to experiment in this direction.

We were surprised, last year, in testing the pressure exerted by the sap of various trees, to find that a black birch root, detached from the tree, was able to force water to the height of eighty-six feet. We were therefore somewhat prepared for an exhibition of considerable power, but the results of our trials have, nevertheless, been most astonishing.

At first, we thought of trying the expansive force of some small, hard, green fruit, such as a hickory nut or a pear, but the expansion was so slow, and the attachment of the fruit to the tree so fragile, that this idea was abandoned. The *squash*, growing on the ground, with great rapidity, and to an enormous size, seemed, on the whole, the best fruit for the experiment.

Accordingly, seeds having been obtained from Mr. J. J. H. Gregory, of Marblehead, they were planted on the first of July, in one of the propagating pits of the Durfee Plant-house, where the temperature and moisture could be easily controlled. A rich bed of compost from a spent hot-bed was prepared, which was four feet wide, fifty feet long, and about six inches in depth. Here, under the fostering care of Prof. Maynard, the seeds germinated, the vine grew vigorously, and the squash lifted in a most satisfactory manner.

Never before has the development of a squash been observed more critically, or by a greater number of people. Many thousands of men, women and children, from all classes of society, and of various nationalities, and from all quarters of the earth, visited it. Mr. D. P. Penhallow watched with it several days and nights, making hourly observations. Prof. H. W. Parker was moved to write a poem about it, and Prof. J. H. Seelye declared that he positively stood in awe of it.

Power of Roots.

The growth of a plant depends chiefly upon the amount of water which is exhaled by its leaves, and this necessarily depends upon the supply furnished by the roots. The folly of ploughing between rows of corn, or other plants, after their roots have spread widely through the soil, is self-evident. Prof. L. B. Arnold says he has known the maturing of a corn crop postponed ten days by plowing it at the last hoeing.

The penetrating power and tendency of roots is well illustrated in the case of an apple tree on the College farm, which forced its roots down through a mass of coarse gravel eight feet, to obtain a supply of water. The stones were about the size of hens' eggs, and so closely packed by the waters of the drift period which deposited them, that the cylindrical form of the roots was entirely destroyed. The growing tissues pressed themselves into every crevice, so as actually to surround and enclose the adjoining pebbles. A similar root of an elm was recently dug up in Westfield, Mass., and presented to the College museum by Mr. B. H. Averell. Prof. Stockbridge, last fall, washed out a root of common clover, one year old, growing in the alluvial soil near the Connecticut River, and found that it descended perpendicularly to the depth of eight feet. Mr. Mechi, of Tiptree hall, England, tells us that the reason that clover is usually so short lived, is the fact that the lower roots are either unable to penetrate the subsoil, or to find in it the requisite supplies of food. He also states that his neighbor, Mr. Dixon, of Riven Hall, dug a parsnip which measured thirteen feet six inches in length, but, unfortunately, was broken at that depth.

The roots of lucerne often penetrate to the depth of more than twenty feet, while the tap-roots of trees, continuing to grow for a long period, descend still further. A British officer in India reports that the roots of a leguminous tree—the *Prosopis spicigera*—is often dug for economical purposes, and that he has seen an excavation sixty-nine feet deep made for such a root without reaching its lower extremity. The roots of trees are well known to extend in a horizontal direction to surprising distances, and to exert a very deleterious influence on crops in their vicinity. The living roots of an elm, in Amherst, were found in abundance at a distance of seventy-five feet from the trunk, which was just the height of the tree. It has recently been stated in *The Field*, an English paper, that the roots of an elm were found to obstruct a tile-drain which

was four hundred and fifty feet from the tree.

But our squash-vine affords the most astonishing demonstration of all that has been said about root development. Growing under the most favorable circumstances, the roots attained a number and an aggregate length almost incredible. The primary root from the seed, after penetrating the earth about four inches, terminated abruptly, and threw out adventitious branches in all directions. In order to obtain an accurate knowledge of their development, the entire bed occupied by them was saturated with water, and after fifteen hours, numerous holes were bored through the plank bottom, and the earth thus washed away. After many hours of most patient labor, the entire system of roots was cleaned and spread out upon the floor of a large room, where they were carefully measured. The main branches extended from twelve to fifteen feet and their total length, including branches, was more than two thousand feet. At every node, or joint of the vine, was also produced a root. One of these nodal roots was washed out and found to be four feet long, and to have four hundred and eighty branches, averaging, with their branchlets, a length of thirty inches, making a total of more than twelve hundred feet. As there were seventy nodal roots, there must have been more than fifteen miles in length on the entire vine. There were certainly more than eighty thousand feet; and of these, fifty thousand feet must have been produced at the rate of one thousand feet or more per day.

Now, it has been said that corn may be heard to grow, in a still, warm night, and it has been proved that a root of corn will elongate one inch in fifteen minutes. But here are twelve thousand inches of increase in twenty-four hours. What lively times in the soil, where such vital force is at work! The wonder is that we do not hear the building of these roots as it goes on.

Our squash produced one leaf at each node, and all the leaves were arranged in two rows on opposite sides of the stem. The vital force in the tip of the vine was very active and vigorous, and displayed its power in the constant organization of new nodes. Thus, when we examined the terminal inch of the vine, we found no less than twenty-five young leaves, and in the axils of these twenty-five flowers, including five young squashes, twenty-five branching tendrils, and twenty-five buds for lateral branches. These were continually reproduced, so that when the vine was growing nine inches a day, as well as after it had developed one hundred nodes, the number was always about the same. All parts of the vine and its appendages increased with marked uniformity. Back of the first inch, which may be regarded as the terminal bud, about six nodes were developing at the same time. The growth was most rapid in the terminal portion of each node, and the leaves were not modified particularly in form during the period of development. The lengthening of the vine proceeded somewhat irregularly, varying from nothing to nine-sixteenths of an inch per hour. It was usually less between midnight and sunrise than at other hours.

The longest growth of the main vine in twenty-four hours, was observed August 15th and 16th, from 7 A. M. to 7 A. M., and amounted to nine inches. The laterals were removed when two or three feet in length. The total extent of the main vine was fifty-two feet, and the number of nodes was one hundred. At each node of the fully-developed vine were found a large leaf; a long, branching tendril, resembling the veins of a leaf, without the intervening cellular tissue; a staminate flower on a long stalk, or a pistillate flower on a short stalk; a lateral branch, and, on the under side of the vine, a long, branching root. The function of this root was evidently to supply water to the leaf above it, and its development, of course, depended chiefly upon the nutrient material elaborated by this leaf. These nodal roots not only furnished a much larger feeding-ground for the plant, but saved an immense amount of mechanical work in reducing the distances through which the crude and elaborated saps must be carried.

The largest leaves of the squash-vine were

nearly circular, and slightly lobed, with a diameter of two feet and a half, and a superficial area of about seven hundred square inches. The leaf-stalks were hollow, two feet in length, and curiously marked with vertical striæ, alternately light and dark in color. The light lines were found to contain bundles of fibro-vascular tissue, while the dark ones were simple cellular tissue, containing chlorophyl.

Mr. J. J. H. Gregory informs us, that if a shingle be set into the ground near the tip of a growing squash-vine, it will, in a day or two, be seen turning toward it; and that, if the shingle be removed to the opposite side, the direction of the vine will again be changed. He also states that he has observed a squash-vine, after running along on the ground ten or twelve feet, and then passing under the branches of a tree which were four feet above it, to stop and turn upward toward the branches. After growing in this direction till it could no longer sustain itself, the vine fell to the ground; but instead of proceeding horizontally, it again rose into the air, again to fail. A third effort was made before the plant was willing to give up and trail humbly on the earth.

The end of the vine under observation was constantly elevated to the sash-bars and glass above it, sometimes to the height of two feet, and as it increased in length, was pushed along against them. The extent and velocity of the terminal motion were doubtless greatest in August, when growth was most rapid.

The apparatus for testing its growing force consisted of a frame, or bed, of seven-inch boards, one foot long. These were arranged in a radial manner, like the spokes of the lower half of a wheel, their inner edges being turned toward the central axis. These pieces were held firmly in place by two end boards, twelve inches square, to the lower half of which they were secured by nails and iron rods. A hemi-ellipsoidal cavity, about five inches deep in the centre, and eight inches long, was cut from the inner edges of the seven boards, and in this the squash was carefully deposited, the stem and vine being carefully protected by blocks of wood from injury by compression. Over the squash was placed a semi-cylindrical harness, or basket of strap-iron, firmly riveted together. The meshes between the bands, which crossed each other at right angles, were about one inch and a half square. The harness was twelve inches long, and the same in width, so that when placed over the squash, it just filled the space between the end boards. Upon the top of the harness, and parallel with the axis of the cylinder and the squash, was fastened a bar of iron with a knife-edge to serve as the fulcrum of a lever to support the weights by which the expansive force was to be measured. At first, an iron bar, one inch square, was used for a lever, then a larger bar of steel, then a lever of chestnut plank, then one of seasoned white oak plank, and, finally, one of chestnut, five by six inches square, and nine feet long; but even this required to be strengthened by a plate of iron four inches wide by half an inch thick and five feet in length. The fulcrum for the lever was also renewed from time to time as the weight was increased.

The following table shows the weight of iron lifted by the squash in the course of its development:

Date.	Pounds.	Date.	Pounds.
Aug. 21.....	60	Sept. 14.....	1,300
22.....	69	15.....	1,400
23.....	91	27.....	1,700
24.....	162	30	2,015
25.....	225	Oct. 3.	2,115
26.....	277	12.....	2,500
27.....	356	18.....	3,120
31.....	500	24.....	4,120
Sept. 11.....	1,100	31.....	5,000
13.....	1,200		

The growing squash adapted itself to whatever space it could find as readily as if had been a mass of caoutchouc; nor did it ever show the slighest tendency to crack, except in the epidermis. This would often open in minute seams, from which a turbid, mucilaginous fluid exuded. In the morning, drops of this would frequently bedew the protuberances, like drops of perspiration. In the sunshine these dried up and fell off as minute globules, resembling gum arabic.

The lifting power was greatest after midnight, when the growth of the vine and the exhalation from the foliage was least.

The Greenhouse.

Greenhouse for July.

IN our last we anticipated an ungenial planting season, preventing early planting and satisfactory growth of plants in the open ground. This has been realized; during the end of May we had severe frost, in the third week, and harsh, drying winds, which prevented plants from making any progress, so that at the end of May we had still much planting out to do, for the ground was so dry that it was a question which made least labor, to water inside several times in the day, or to water over a much larger space once a day outside. We object to outside watering in very dry weather, on principle, for if commenced it must be continued until it rains, and the plants are chilled from the extra evaporations during the cold nights. It was only 47° at 4.30 A. M. on the first of June; in such a low night temperature tender plants can make no progress in the tops, and if the soil is chilled by heavy watering the roots will not start. It is surprising how quick the roots usually strike into the soil at this season, in spite of cold and drought. We had occasion to take up a large American Aloe four days after planting, and found young roots starting out in all directions; but plants turned out from small pots in very dry weather often become dust-dry before the roots can strike into the soil, and die unless watered. Continued stirring the soil with the hoe before plants are established, and a mulching with half-decayed manure is the best system to prevent evaporation and dispense with continued watering.

Camellias will have finished growing and set their buds, and can now be placed outside, in a shady place. We had still a few white flowers at the beginning of June; this gives a season of seven months for Camellia flowers. These late flowers come very useful for bouquets and funerals, when there is not heat enough kept up for flowering Eucharis all the year. See that those plants which are planted in the open border are not allowed to become dry; they require a large quantity of water if the drainage is good, and to be well washed over the foliage each afternoon.

Double Primulas will now require dividing and potting in small pots. If the plants are at all lagging it is a good plan to turn them out of the pots into a bed of good soil, in a shady frame, planting deep. Roots will then form on the old stem, close to the foliage. The same result may be obtained by surfacing the pots with fresh soil, but this is not so easy in the case of large old plants. Of course the tops may be cut off and treated like cuttings; but for the general class of cultivators it is least trouble to obtain rooted cuttings on the original plants. When dividing the plants it is best to cut away as much of the old stem below the young roots as possible. If this is not done it frequently decays, and extends to the heart of the plant. The best feeding roots are formed at the collar, so that it does not injure the future plant to cut away the old stump. Pot the plant deep enough for the soil, when complete, to be close to the foliage. If this is not done, when the plant begins to make large leaves, it requires support to prevent it falling to one side, and a risk of breaking off at the surface, as it will never be firm in the pot. Make the soil quite firm in the pots, and give water enough to well moisten the soil; but the plants must not be saturated until well filled with roots, or the soil is made sour, and they never root freely. The plants should be placed in a moist, shady frame, and kept rather close during the day, with abundance of air during the night—in fact, they are best entirely exposed at night, unless there is a risk of heavy rain. We have seen these plants destroyed by a heavy thunder shower when fresh potted. Care must be exercised in watering to keep the water out of the hearts of plants, the foliage being liable to decay and rot the plant at the surface of soil. Any good, rich soil, with the addition of rather more sand than is used for general potting, will grow these plants well, and a moderate sized pot is best; the soil is not so likely to become sour from careless watering. We

prefer to drain the pots for these plants; in fact, for many soft-wooded plants it is well to place a single piece of broken pot or a small oyster shell over the hole in the bottom; it prevents the roots from running out of the pot so readily, for it will be often found that the roots run straight through before there are many formed in the pot; this is especially the case if the plants are suffered to become very dry, the roots run out in search of moisture.

Azaleas will require abundance of water, and good washing of the foliage with hose or syringe. Be careful that fresh potted plants do not become dry in the old ball of roots. This is one of the most frequent causes of sudden death which the novice in growing hard-wooded plants finds it difficult to explain. If any plants require fresh pots do it at once. It is not wise to leave this work until late in the season; the pots do not become filled with roots before winter, the plants become unhealthy and do not flower well. If desirable to add newer and better varieties to the collection, it is well to look out early; the first customers have a better choice of plants. We usually make up our list during the flowering season, and forward it, to be filled as soon as the plants have ripened their wood.

Climbers, on roof and in pots, must be trained before they become entangled in a mass of confusion. Do not train in a stiff, formal shape, but allow as much natural form as possible. The Tacsonias and Passifloras never show their full beauty unless in a natural shape; for this reason the plants are best planted out and trained on the roof. The new Tacsonia insigna is said to be a very fine thing, and the colored plate is certainly fine. We have not flowered it yet, for it has only been distributed a few months, but we have it growing fine on the roof, and it will probably flower during the summer. The foliage is very distinct from any of the old varieties. Stephanotus floribunda will now be in full beauty, and will require abundance of water. See that mealy bug does not get established at this season, or the flowers will be spoiled. This can be trained in closer than many other creepers without spoiling the beauty of the plant. Winter bloomers, such as Thunbergia Harrisii, will be growing finely, and will require tying to prevent rambling too much. Cissus discolor, Dioscoreas, and others used for summer decoration, will require abundance of water.

Heaths and Epacris will require careful watering. If these plants become very dry or water-logged they are sure to die. Rain water is best for these plants, in fact for all plants; but hard water, or such as contains lime, is very injurious to the above-mentioned plants. The Epacris is a very useful plant for winter cut flowers, and it does these plants no harm to cut the flowering shoots, for they require cutting back after flowering, if good, bushy plants are required; but, excepting the Willmoreana and Hymalis sections of Heaths, very few will stand much cutting, the plants being of very slow growth.

Myrtles, Diosmas, and other greenhouse plants employed for cutting to mix with cut flowers in winter, must be trimmed into shape if required, and induced to make a free growth for next season. These plants, if grown in pots, require lots of water during summer; but, if convenient, a plant or two planted in some corner of the greenhouse gives more wood than a number cramped in pots. The European Myrtle is not so much grown as it should be in this country for furnishing green for bouquets, etc.

Cactus, in variety, will now require more water than at any other season. It must be remembered that although in their native districts these plants are exposed to long droughts and full sun, the plants are then growing in soil in which the roots can travel very long distances in search of moisture, and under very different conditions to those grown in pots. The night-flowering species will now produce their fine, large flowers, which are very handsome, and only to be seen in full beauty after sunset. Where convenient to plant these sorts out they flower much better, with very little attention.

Hanging baskets will frequently require water if exposed to full sun and wind, which

is the usual position during the summer, when plants are liable to be forgotten during the absence of the owner. Baskets filled with Echeverias, Othonna crassifolia, Sempervivums, Epiphyllums and drooping Cereus are capital plants for the purpose. A few days' neglect will do no permanent injury to the plants. If the dead flowers are picked off regular the Othonna will flower all the year, but is best filled with young plants in spring and autumn.

Palms.—Specimen plants of these, employed for effect on the lawn, either planted out or in pots and tubs, must have abundance of water. If allowed to become dry the foliage is a bad color, and the ends of leaves shrivel and die. This is more frequently the cause of these plants being unsatisfactory outside than any effect of the change, for many species are natives of a moderate, average temperature. Specimens in the greenhouse will now be growing very fast, and will require abundance of water. In fact, there is no class of plants which requires so much water as palms. It must be remembered that some of the species, which are natives of thick, shady forests, will not stand bright sun. These kinds are useless for outside decoration, and must be shaded indoors. Geonoma pumila is a well known species of this class. The Kentias will be a useful class for both cool house decoration and also for the pleasure ground in summer, but, unfortunately for the grower of small means, the plants are high priced from the supply being limited; but Seaforthia elegans and Ptychosperma Alexandræ are nearly as handsome in the same style of growth, are very easily grown, and of a moderate price. The old Latania Borbonica is another capital palm for outside and cool house decoration. Small plants of this can be obtained as cheap as Geraniums. This is a good example of the fan palm class, and will bear much hard usage without permanent injury. Any specimens requiring larger pots should be shifted at once, but if plenty of water is given, these plants will keep in good condition for a long time in a moderate-sized pot or tub, and if allowed full development for the roots the plants soon become too large for a moderate sized house.

Marantas will now be growing very fast, and require plenty of water and also a moist, shady atmosphere, or the beautiful colors of the leaves will not be developed, and the plants will be troubled with red spider, and the ends of the leaves will burn. Any specimen requiring more room must be potted at once, and those in small pots surfaced with light, rich soil. Wash the leaves frequently, to keep them free from dust..

Orchids will require plenty of water at this season, with a very moist atmosphere. On very hot, dry days those plants on blocks must be syringed several times during the day, for most of the species will now be in full growth. Such plants as Dendrobium nobile, when growth is complete, must have plenty of light; in fact, we have placed these plants out of doors in full sun for a month at this season, with the best result; but care must be exercised to prevent heavy storms from saturating the pots. We usually remove these plants to a light, airy house for two or three months. Large plants of Cœlogyne cristata will require abundance of water; but see that it does not lodge in young shoots, or they will rot off. Any late blooming Cattleyas in pots, if the roots are not in good condition must be shaken out and repotted in fresh soil, or the growth will be poor. Stanhopias will be in flower. Care must be used when the flower stems are showing that the plants do not become too wet, or the spikes often shrivel up without opening the flowers. These plants generally attract much attention from the large size of the flowers, and the flowers coming down through the bottom of the basket; for this reason these plants must be grown in baskets or on blocks. Many species are of such a powerful perfume that it is not pleasant in a small house or room, but the plant may be suspended from the branches of a tree in the open air while in flower; the flowers will last longer and the heavy perfume, being more diffused, will not be unpleasant. Ruckeri and Amœna are two of the best species; the

Garden Gossip.

Spring Flowers.

I WELL remember a visit I paid a few years since, in England, to what was termed "A Spring Flower Garden," and the effect of this grouping together of our earliest blooming plants, seemed especially deserving of imitation.

After passing through a long, bleak winter, the very sight of a modest little snowdrop appears to infuse new life into the florist's veins, but to view, as I did, a large collection of just such "harbingers of Spring," of various forms and colors, and arranged in such a natural manner, was as novel as it was beautiful.

There is no lack of hardy perennials blooming early in the season, although they require different treatment, and different soils. Some that prefer a peaty soil, would languish in the sandy locality just suited to others; and the rocky, exposed spots, where a portion would be entirely at home, might be certain death to another class.

To make such a collection complete in all its details, a spot of ground should be selected with a southern exposure, and protected from the cold winds. One corner might be devoted to a little mound of rocks, disposed in a natural manner, and set with the dwarf-growing alpines, and some of the smaller bulbs. If water should be introduced, and caused to trickle down over one side of the above, as well as to form a little running stream through a portion of the beds, it would be a decided advantage to the moisture-loving species.

The larger portion of the alpines prefer a gritty, or gravelly soil, and some of them succeed best in sand and peat, so that the characters of each should be carefully studied, and the soil properly prepared for each, else it will be useless to plant them. Chief among this class of dwarf plants we may mention the *gentians*, very beautiful, and very difficult to grow properly; *G. acaulis* is probably as certain to succeed as any, and if healthy, the rich, deep-blue flowers are really unsurpassed.

The *Rock Alyssum* (*A. saxatile*) produces a profusion of yellow flowers in spring, and grows well on the rock-work. The *Androsace* family, like the Gentians, are difficult to manage, but they are especially neat and pretty when in bloom; and even the plant itself reminds one of a dense mass of rich green moss.

Anemone pulsatilla is a valuable little "Wind-flower" that blooms very early, producing purple-colored flowers.

Arabis alpina, the Alpine Rock Cress, shows its numerous white flowers quite early, is hardy, and very easily managed.

Iberis sempervirens, the Perennial Candytuft, has a profusion of snowy-white bloom in April and May.

Primroses and *cowslips* must certainly have a place in this department, no matter if they are old-fashioned, but they succeed best in partial shade.

And the *violets*, too, for some of them are hardy, especially if well protected during winter, and well do they repay us for a little extra trouble.

For our early Spring Garden, we must depend on the bulbous plants to a great extent. Prominently in this connection, comes the *Snowdrop*, *Crocus*, *Scillas*, *Snowflake*, *Bulbocodium vernum*, *Grape* and *Musk Hyacinths*, *Daffodils*, and *Early Tulips*. These must all be planted in the autumn, as indeed should all the plants which are enumerated in this paper, so that they may become established in their new homes before the warm suns of spring bring out the bloom.

In our own native flora may be found as pretty a set of plants for spring blooming as those taken from the lists of high-priced exotics.

The general impression that "wild flowers" will die if removed, arises in most instances from the fact that the transplanting usually takes place whilst they are making a vigorous growth and bloom. Of course they will die, and so would a fruit tree, if moved when growing and in blossom. Leave these plants until the foliage shows signs of maturity, then the operation will be comparatively easy. Those species which are found in shady spots

should have a like situation in their new quarters, and others that really prefer the full rays of the sun, may be planted in the most exposed places.

As a partial list of native plants for early bloom, we would suggest *Anemone nemorosa*, *Hepatica triloba* (Liverwort), *Caltha palustris* (Marsh Marygold), *Arabis lyrata* (American Rock Cress), *Claytonia Virginica* (Spring Beauty), *Dicentra cucullaria* (Dutchman's Breeches), *D. Canadensis* (Squirrel-corn), *Epigæa repens* (Trailing Arbutus), *Erythronium Americanum* (Dogstooth Violet), *Mertensia Virginica* (Virginia Cowslip), *Phlox subulata* (Mountain Pink), *Saxifraga Virginius* (Early Saxifrage), *Viola blanda* (Sweet White Violet), *V. sagittata* (Arrow-leaved Violet), *V. cucullata* (Hood-leaved Violet), *V. pedata* (Bird-foot Violet), etc.

The above will be sufficient for a commencement, and others may be added as experience teaches what will best succeed.

H.

Pluck.

SOME people consider taking the entire charge of one's own garden in the light of true heroism, and that the man who possesses the courage to ignore the professional gardener, and in his stead superintend the preparation of his soil, the planting of the seeds, the arrangement of his lawn, the charge of his greenhouse, and the hundreds of minor matters as well, is little short of a mortal whom one might read about in the pages of a romance, but never see in real life.

But there are hundreds such as these, scattered all over our land, whom we may well be proud to honor, as the typical American, divested, indeed, of all aspiration for fame in horticulture, that does not originate from his own practical personal experience. And what can we say for the typical woman, as well—the true country lady, who deems it as much of a duty to oversee personally, every portion of her domain, be it large or small, as it is to bestow her personal supervision on every department of her household arrangement?

We know we speak the opinion of every right-minded horticulturist when we assert that to such as these all honor is due. Not that they need any such incentive, for the fruits of their labor are a far greater reward than any commendation from the writer's pen.

To learn all the little arts of the science, or profession (or by any other term that may be applied to gardening), requires something else than the mere fact of looking after the help; it means that we must "put our own shoulder to the wheel," roll up one's sleeves, and unravel mysteries through the medium of one's own hands.

In a commercial point of view, this subject acquires additional force, for if anything will induce some people to superintend their own work, it is assuredly this direct appeal to their pockets. And yet, independent of this strictly pecuniary, or selfish motive, we have many instances on record where men, and women too, have made horticulture the business of their lives, solely from a love for the pursuit; and singular as it may appear, such as these are successful in their enterprise, with scarcely an exception. Is not the reason sufficiently plain? It is because their heart is in their work, and like the thrifty, "forehanded" farmer, they say "come, boys," in the place of "go, boys," which is simply another way of expressing their desire to help themselves.

COMPARATIVELY few persons are aware how very attractive evergreens appear when closely massed on the lawn. A bed of young plants, say nine or twelve inches in height, with distinct foliage, is particularly pleasing. One of the best for dwarf bedding is the genus *Retinispora*, with its delicate, attractive branchlets. A bed of these, composed of the now numerous forms, is a sight to be remembered, and is quite as handsome as a collection of choice bedding plants. The many dwarf forms of Arbor Vitæ, Spruce, etc., are also a valuable auxiliary for this system of bedding, and when interspersed with a few Junipers, the fine effect is considerably enhanced. The variegated evergreens must not be overlooked when making the selection. —*Josiah Hoopes.*

The Flower Garden.

Floral Novelties of the Year.

LESS novelties of startling merit have been introduced this year than for some seasons previous, and we have taken little pains to ascertain the merits and demerits of those introduced within a year. However, Mr. Vick, of Rochester, who has experimental grounds, and is as fair-minded in reports, as any tradesman, gives the following notes of the best, which seem to deserve more than a passing notice; although he does not hesitate to condemn any which would prove liable to disappointment and failure.

Some of them may be newly discovered species, but usually they are supposed to be improved varieties of some of our old favorite flowers. A new color, even, of many kinds, like Phlox, is sufficient to make a novelty. Some of these novelties are acquisitions for which we have reason to be thankful, but the majority are generally unworthy the notice of American cultivators. A little difference in form, or a new shade of color, is not of sufficient importance to most of our readers to induce them to pay the price usually demanded for these *new* things, while other varieties really as good can be bought for a tenth of the price. There are some, however, who desire the new, and when money is not scarce, it is a desirable ambition. We give below a full list of novelties for this season, with such remarks on each as we believe to be truthful, though in some cases we have had to rely on the descriptions of others:

Agrostis minutiflora.—An elegant ornamental grass of compact growth, with a mass of erect culms, terminated by a large inflorescence of airy lightness. Recommended for vases, as well as for cutting for winter bouquets.

Alonsoa linifolia, Roezl.—This is a new, and said to be a very pretty Alonsoa, introduced by Roezl. The habit is certainly very fine, and the flowers are also good. The plant is from twelve to eighteen inches in height, and the leaves are narrow and flax-like. It is said also to flower very freely. Flowers scarlet.

Alonsoa myrtifolia is introduced by the same, as the name indicates, with leaves like the Myrtle. It is of more vigorous habit than the previous one, and grows more than two feet in height. Very large flowers, of intense scarlet.

Amaranthus amabilis tricolor.—A species of Indian origin; plant of a bushy habit, twenty inches in height; leaves broad and long, rose, yellow, and fiery red, studded with spots of intense brown.

Amarantus Henderii.—This is thought to be the most beautiful Amaranth grown; from three to five feet in height; leaves long, sometimes twelve inches; and with the branches gracefully bending.

Amaranthus olbiensis Queen Victoria.—Leaves long and narrow, like *A. salicifolius*, but red and yellow, like *A. tricolor*, and if it generally comes true and the colors are bright, it must be a very pretty plant indeed.

Amarantus sanguineus elator.—This is represented as a mammoth variety, often nine feet in height, while the colors, claret on the upper side of the leaf and crimson on the lower, are said to be strong and clear.

Amarantus salicifolius splendidissimus.—An improvement on A. salicifolius, but in what way we have not been able to learn, unless in a brighter colored leaf, which is said to be "rich golden and purplish red."

Bismarck Larkspur.—Flowers red-striped, and thought to be a cross between the Candelabrum and Emperor Larkspur. Growth only from nine to ten inches.

Blumenbachia (Cajophora) coronata, which we have never seen, is represented as a pretty plant, with large orange-colored flowers. It is a native of Peru, and was sent from there by Mr. Pearce, late botanical collector for James Veitch & Sons, of London. The flowers are borne in great profusion, and are of a striking orange-red color, coronal shaped, about three-quarters of an inch deep, and an inch-and-a-half in diameter. The plant is covered with stinging, nettle-like hairs, like the Loasa.

Celosia cristata variegata, var. pumila.—

A dwarf variety of the variegated Cockscomb introduced several years ago. That was so untrue that it proved useless, and the more conscientious seedsmen of Europe refused to sell it on this account, as several informed us when we sent them orders for the seed. It was also so late as to be of little account except at the South, even had it proved true. This dwarf sort may or may not prove better.

Cellular Victoria Aster, crimson.—A new and bright color of the Victoria Aster. It is said to be very constant in its color.

Centaurea Americana Halli.—This is advertised as a new color of our American Centaurea, from Texas, but we have no doubt t is the same we have supplied to our customers for several years. All who have sown our Centaurea seeds, know there are two colors, one lilac, and the other purple. We have never separated them, and we have no doubt it is this dark purple variety that is now sent out on the other side of the water as a novelty.

Cleome Sesquiorgyalis.—This is a remarkable annual on account of its great size, good specimens growing ten feet in height. The leaves are very large. It certainly will be a curiosity, and all will like to see it, but if the engraving is correct, we cannot think that as an ornamental plant it will ever equal the Ricinus, which, for a large ornamental annual, and for common use, is without a rival—that is, in our opinion. It is from South America.

Dianthus barbatus nanus compactus flore-pleno—all of which simply means, *Compact Dwarf Double Sweet William.* This is a very neat dwarf variety of the Sweet William first brought out last season. The habit of the plant is very good, but we have not yet seen the flowers.

Double Cineraria.—New colors and superior strains of the Double Cineraria are described by several of the European florists.

Eragrostis maxima.—A new Ornamental Grass from Abyssinia, from three to four feet in height, and a strong plant. It is said to produce from fifty to a hundred richly-leaved culms, and very handsome, terminating in graceful panicles. It is an annual.

Fedia cornucopia floribunda.—Leaves very decorative, with a mass of brilliant scarlet flowers.

Fenzlia dianthiflora alba.—This is a white variety of the little and pretty Fenzlia dianthiflora.

Gomphrena prostrata var. argentea.—Low, prostrate plant, forming almost a carpet; leaves and flowers white.

Imbricated Pompon Aster, White.—The Imbricated Pompon are the most perfect and beautiful of all the small Asters. This new white variety, like the White Dwarf Chrysanthemum, changes to azure blue after being open for a day or two.

Leptosyne Stillmanni.—A composite annual of dwarf habit, only about nine inches in height, blooming freely, with large orange-yellow blossoms. Perennial, and recommended for herbaceous borders.

Linaria Maroccana was discovered by Dr. Hooker on the Atlas Mountains. Flowers purplish, and continue in flower a long time.

Loasa hispida, Roezl.—This is an erect-growing species of Loasa, attaining three feet in height, with narrow leaves six inches in length. Plant two feet in height. Flowers yellow and white.

Lychnis Haageana nana.—A dwarf Lychnis with flowers as large as the old varieties of Haageana, while the plant being only eight inches in height and very compact, is not apt to be injured by the winds, like the larger sorts.

Lychnis Haageana nana hybrida.—A new dwarf Lychnis, with flowers as large as the old Lychnis Haageana, while the plant only attains eight inches. If flowers are abundant, it must make a very pretty plant, and if it will endure our hot sun, may make a desirable plant for bedding.

Lychis viscaria alba is a white variety, and is new only in color.

Myosotis Alpestris, Dwarf White and Blue, two dwarf and very pretty Forget-me-nots from the Alps. Only about four inches in height.

Nasturtium Ruby King, a dark-leaved dwarf Nasturtium. Flowers very pretty pink,

shaded with carmine. In England the Dwarf Nasturtiums are excellent bedding plants, giving fine masses of color, but in this country, perhaps on account of our summer's sun, they do not flower freely.

Oxalis rosea alba, a white variety of annual Oxalis that re-produces itself from seed.

Penstenmon Palmeri is of very robust habit, growing four or five feet in height, with broad, short and open mouth. The corolla of the flower is peach-colored, the reflexed lobes of the lower lips marked by a central reddish line, and remarkable for its conspicuous projecting yellow-bearded sterile filament. We saw it in the Rocky Mountains, and have obtained seeds from Utah.

Phlox Drummondii grandiflora splendens, one of the new large-flowered Phloxes; and they are really magnificent. In less than ten years from this time the Annual Phlox will be the best and most popular annual in cultivation in America—at least so we think—and and in no place do they flourish as in America. This professes to be a new color, but if the colored plate is a fair representation, we had abundance of this color in our grounds last year.

Phlox Drummondii nana compacta (*Chamois Rose*), a dwarf, compact Phlox, of a chamois rose, or somewhat nankeen color; but we have never found these dwarf Phloxes healthy. They all seem to be sickly and unable to bear an American sun. We have hundreds of dwarf plants every season, but could never select seeds that would give a healthy plant.

Phlox Heynholdi cupreata.—Flowers of a pretty coppery hue, but we would not give a penny for the whole Heynholdi strain of Phlox. Each plant needs an attendant with an umbrella to protect it from the sun.

Rhodanthe Manglesii flore-pleno. — A double variety of that old and beautiful everlasting *R. Manglesii*. A double dwarf variety is also advertised, with smaller flowers, but so abundant as to literally cover the plant. We are really prepared to believe these are decided acquisitions, and shall await their flowering with the greatest interest.

Ricinus "Duchess of Edingburgh."—A bronze-leaved variety from the island of Suzon. Of a compact branching habit, five feet in height. If the description is true, which represents the foliage to be dark reddish-purple, this must be a valuable acquisition indeed.

Ricinus Gibsonii is a remarkable Ricinus, or Castor-Oil Bean. It grows four or five feet in height, and its only merit over other varieties is that it has deep red foliage. If the color is bright and good it must be a desirable acquisition, particularly for this country, where the Ricinus does so well. It is said to be a native of the Phillipine Islands, and was named in honor of Mr. Gibson, of Hyde Park. We are hoping a good deal from this.

Scabiosa major grandiflora fl.-pl.—This is recommended as a double Scabiosa like the dwarf double sorts, but very large, three inches in diameter, and blooming until frost. All varieties of Scabiosa bloom late, and sometimes survive the winter and flower the second season, even as far north as Rochester.

Scabiosa candidissima plena.—Our readers will recollect the Double Dwarf Scabiosa, introduced some ten years since. This is a white variety, and being pretty pure in color it is claimed will be desirable for bouquets.

Scabiosa Tom Thumb, fl. pl.—This is a very dwarf double sort, not growing more than seven or eight inches in height, and therefore may be useful, when it becomes plenty, for edgings.

New Pelargoniums.—The following new double-flowered Zonales, raised by M. Jean Sisley, have been introduced in Paris this season.

George Sand—flowers large, white if kept in doors, and assuming a slight rosy flesh color when exposed to the sun.

Francois Pertusati—flowers large, yellow, margined with white.

Carl Vogt—flowers of medium size, of an orange salmon color, quite new shade.

All the foregoing are fine growing varieties.

Gardening.

Subtropical Gardening.

Read before Massachusetts Horticultural Society.

BY WILLIAM GRAY, JR.

SUBTROPICAL gardening, so called, means the combination of plants remarkable for habit and foliage with the brilliant flowers, which formerly were used alone under the name of "carpet bedding."

Some years ago, when this last system had reached its climax of absurdity, with its meaningless masses of glaring, unrelieved color, and its ribbon borders wandering aimlessly all over the land, taxing the resources of the largest places to raise Coleus and Pelargoniums by tens of thousands, a new departure was taken in Paris by the use, in the smaller parks and squares, of plants of striking foliage to relieve and diversify the masses of color.

To William Robinson, more than to any other person, is due the credit of introducing this great improvement into England. As correspondent of the London *Times* he went to Paris in 1867, and by his letters to that journal gave the impetus to the change which has revolutionized English summer gardening. He has since published many books, the main feature in all being an earnest advocacy of a more natural style, and has established "The Garden," that admirable magazine, whose motto, "The Art itself is Nature," is the keynote to all his writings. And I am told that now, as is usual in gardening matters, the English excel the French in the arrangement and effect of their groups and beds.

To come nearer home: we have a climate better than that of Paris or London for the growth of tropical foliage, and are free from the constant rains which in England mar the beauty of their flowering plants.

It is not necessary to say much about the detail of cultivation; the beds must be deep and rich; mine are four feet deep, filled with an equal mixture of loam and well-rotted manure, for flowering as well as for foliage plants. By digging over every autumn, beds so made will last many years without showing signs of exhaustion; the value of such preparation is that watering is rarely needed, even in our longest droughts. I find, also, that a mulch of two inches of spent hops, spread over the ground at the time of planting, is of great benefit; it keeps the ground moist, prevents hardening from rain and the cracking afterwards in the sun, keeps down weeds, and prevents the spattering of earth on the foliage, which so disfigures it, especially that of variegated Pelargoniums. If one wishes fine beds of bloom it is necessary to have some way of protecting them from our heavy thunder showers, which in a few minutes will ruin Pelargoniums for a fortnight. I use light wooden frames, rather larger than the beds, covered on the top only with cotton cloth.

Among suitable plants the Canna takes the first place for beauty, for diversity of foliage and habit, for rapid growth, and, in some of the newer varieties, for the profusion of flowers, almost equal to those of the Gladiolus. Add to these qualities its cheapness, and the ease with which its roots can be kept through the winter, and I know of no plant that can compare with it for general usefulness.

The best kinds tried by me are:

Anneii, tall growing, sea-green leaves, salmon flowers.

Premices de Nice, medium growing, green lanced-shaped leaves, yellow flowers.

Marechal Vaillant, large growing, bronze-veined leaves, orange flowers.

Nigricans, large-growing, metallic leaves, flowers of no account.

Jean Vandael, large growing, green leaves, large red flowers.

Purpurea spectabilis, large growing, greenish purple leaves, scarlet flowers.

For foliage only, *Auguste Ferriere*, of the largest size, green leaved, with narrow stripes and edging of dark red, and *Discolor*, of medium size, with beautifully veined leaves of bronze and green; these two varieties have never flowered with me, but are described in M. Chate's book on "The Canna" as having orange-red flowers. For further information I would refer to the above mentioned book,

where a great number of species and varieties are described.

It adds much to the effectiveness of the beds to plant their centers with Tubers, and to edge them with seedlings of *Canna limbata*. Seeds started early in April will make plants large enough for this purpose by the first of June. They should be set out twelve inches apart, and eighteen inches from the older plants. They grow from two to two and a half feet in height, and, having leaves to the very ground, give a massive effect and luxuriance to the beds not attained by plants from Tubers alone. For color, surround these seedlings with Dwarf Pelargoniums, Golden Feather or *Achyranthes Lindeni*.

Caladium esculentum, five or six in a round bed, planted not too closely; single plants of the green *Arundo donax*, surrounded by those of the variegated varieties; specimens of *Ricinus sanguineus* for red, and *Brasiliensis* for green, which will grow eight feet in height in a single season from seed, in a rich soil and with plenty of water; the dark green *Gymnothrix latifolia*, the perfection of symmetry; and *Erianthus Ravennæ*, the perfection of grace; the *Cyperus Papyrus;* and for those who have room for winter keeping, the *Musa Ensete*, are some of the plants suitable for the purpose.

The surfaces of such beds should be carpeted with dense, low-growing plants of variegated foliage, as *Abutilon vexillarium pictum*, or the Japan honeysuckle (*Lonicera aureo-reticulata*), or flowering plants, as *Lobelia pumila grandiflora*, *Nierembergia gracilis* or *Clematis Jackmanni*.

The Pampas Grass is another superb object, but, unlike those above mentioned (excepting *Erianthus Ravennæ*), may be left in the ground in winter; and, if covered with a large barrel, with strawy manure piled up to and over the top, will generally go through unharmed, and increase in size and beauty year by year. For a perfectly hardy subject the Ailanthus, grown to the height of eight or ten feet, and pruned closely back each year to the top of the stem, will send out long, drooping, pinnate leaves, which rival palms in elegance and effect. *Aralia canescens* and *Dimorphantus Mandschuricus*, entirely hardy, should have a place where room can be given them for the spread of their great leaves. If you have a rocky bank where grass will not grow, plant *Yucca filamentosa*, free flowering and the hardiest of its race.

Succulents may be used in subtropical gardening, but should be kept in beds by themselves, and only planted in the more artificial parts of the grounds. A great variety of these may be grown together—Agaves, Echeverias and Sempervivums. Put the largest plants in the center, leaving room enough between to see them on all sides; finish the bed with one or more rows of *Echeveria secunda glauca*, and carpet the whole with *Sedum Corsicum* or *Pruinosum*. All kinds of geometrical designs may be worked out with these plants, remembering that much of the final effect depends on the most careful and exact planting.

Plants with colored foliage are among the most effective for this style of gardening; neither sun nor rain dim their beauty, and they do not need the constant care and attention that flowering plants must have at all seasons. I would suggest massing them in beds of simple form, circles and ovals being the best, and edging them with plants of a different color; for example: *Coleus Verschaffelti*, bordered with Golden Feather; *Achyranthes Lindeni*, bordered with the striped grass *Phalaris arundinacea picta;* or *Centaurea gymnocarpa*, with a border of dwarf scarlet or pink flowering Pelargoniums.

The golden Crystal Palace Gem, or Albion Cliffs (the best white-edged bedding Pelargonium), edged with a blue lobelia, are types of the many arrangements that may be made from these materials.

Two of the newer bronze zonales, Harold and The Moor, may be planted in small beds by themselves, their golden centres and edges and their brilliant chestnut cones showing to the best advantage next the grass, with no dividing line of contrasting form or color.

Lastly, although hard to grow satisfactorily in our climate, the golden tricolors, Mrs. Pol-

lock and Macbeth, edged with the dwarf-growing and very dark Coleus, Emperor Napoleon, which throws the beautiful colors of the Pelargoniums into high relief.

For flowering plants none are equal to the Pelargoniums. These should be planted in beds of a single kind, edged with one of a different color, or with a variegated leaf, or with a plant of a different species. The best that I have tried are:

Gen. Grant, Warrior,	Tall-growing scarlets for large beds.
Coleshill, Sir Chas. Napier, Sir John Moore,	Medium in size.
Orbiculatum, Omega,	For dwarfs.

Of dark scarlets—Douglas Pearson and Wellington.

Of pink—Master Christine and Pink May Queen.

The whites and salmons are not satisfactory for bedding; the former are not free flowering enough, and a better and more permanent effect can be obtained from the white-edged Albion Cliffs, or from the variegated Alyssum, than from any white flowering plant with which I am acquainted. The Alyssum, when well grown and full flowering, gives one of the softest and most harmonious effects to be obtained from the combination of the foliage and flower.

Centaurea candida is another beautiful edging for beds of Pelargoniums, but it must not be planted too close to them, for if shaded it is almost sure to damp off; in fact, in a wet season it is a difficult plant to keep a line of in good order.

These are some of the materials to be used. Many things have been omitted that cannot easily be obtained, or easily grown, or kept through the winter without great expense; but these, by themselves, if well arranged, will make a garden a source of never failing pleasure to its owner and all comers; and I take it that the highest art is to get the best results from simplest means.

Palms and tree-ferns, yuccas, agaves and musas, all so beautiful, require too much care and are too costly to be generally used.

As to arrangement, it is impossible to give any but general directions, so much must depend on the size and shape, the locality, exposure and surroundings of the garden. The foundation of all must be good turf, well kept. Without this no planting can be satisfactory, and perhaps the best general rule that can be given is to leave the center open for breadth and dignity of effect, and to confine the planting to the sides, following a walk making the circuit of the place.

A New and Beautiful Feature in Landscape Gardening.

FEW can form any adequate idea of the brilliant nature and effects produced by the illumination of a tasteful lawn and pleasure grounds at night by a liberal display of gaslight. This is always expensive, because it can be secured only in densely populated places, where gas is manufactured; but to see the display in all its gorgeous magnificence one must visit the western part of Pennsylvania, where oil wells and gas wells are prolific and possess stores of inexhaustible supply. In the grounds of Senator Anderson, of Titusville, Pa., can be seen the effects of gas illumination to a striking degree; of the way in which the flow of gas from a large gas well was utilized. Mr. William Webster, the landscape gardener, thus writes: "A little more than two years since I was called upon to remodel the pleasure grounds of Senator Anderson, of Titusville. One of the principal improvements then projected was the laying of water pipes for ornamental purposes, such as supplying fountains, an artificial lake, etc.; and about the time of the completing of this work an event occurred which was destined to add still further to the attraction of these grounds.

This event was the striking of the Newton gas well, which created such an excitement at the time on account of the immense flow of gas. So great, indeed, was it, that a gentleman who measured the gas through a meter informed me that the flow was upward of 5,000,000 cubic feet per day, enough to supply the whole city of London or Paris.

When first struck, the noise from the escap-

ing gas was tremendous, and could only be likened to the rushing past at full speed of a heavily laden railroad train, making the very earth around tremble as it escaped from its narrow orifice.

During the excitement a company was speedily organized and pipes laid to bring the gas to Titusville, a distance of more than five miles, and even here in town the pressure is immense. No sooner was the success of the experiment demonstrated, than Mr. Anderson conceived the idea of illuminating his grounds with it, and the result has proved that he was perfectly correct in his estimate of the effect it would produce.

These grounds are in the form of a parallelogram, and are laid out with a serpentine walk traversing two sides of the boundary, between which and the fence is a beautiful bank of shrubs and flowers. The lawn is divided into two parts by a carriage road.

In the center of the front lawn is a large and elaborate fountain, consisting of various figures and a large number of jets, the whole surmounted by a figure of Hebe, pouring water from a pitcher. The basin into which the water is poured is seventeen feet in diameter, in which may be seen a large number of gold fish. A wide gravel walk encircles the basin, flanked with flower beds that are planted with flowers of the most brilliant colors.

About the center of the rear portion of the lawn is a miniature lake, from the center of which rises a pile of conglomerate rocks, with a large revolving jet. On the bosom of this little lake float ducks and swans, and the water teems with the beautiful speckled trout. One portion of the grounds is devoted to croquet and a large covered swing. At the time of laying out of these grounds the streets on the outside were planted with trees of small size, and as it seemed too long to wait, say twenty years, other large trees were removed hither from the forest. These trees have now entered the third season since removal, and are growing vigorously, in all their pristine beauty, and being planted on three sides of the lawn, form a magnificent setting to the gem within.

Beautiful, however, as the scene may appear in sunlight, it is only in the evening, when lit up with the large and numerous jets of gas, that its greatest attraction becomes apparent. The large circular jets seem like coronets of flame, and the arch under which the visitors pass is the most brilliant thing imaginable. It is then that the beautiful effect of the play of the fountains is seen. As the water from the numerous jets is thrown around, the spray appears like showers of pearl and silver against a setting sun.

A *Herald* correspondent in describing a lawn party given on these grounds, characterizes it as a scene of "Oriental splendor," and remarks that "the evening receptions of Queen Victoria in the grounds of Windsor Castle could never surpass the scene of that night."

A prominent architect of Philadelphia also declared that the brilliantly illuminated scene was equal to anything ever described in the "Arabian Nights."

Siberian Arbor Vitæ.

YOUR correspondent is right; this Arbor Vitæ is not a native of Siberia. Its name was probably given in England because its hardiness adapts it to a Siberian climate. The propriety of its name has been illustrated the past winter at the Garden City of Mr. Stewart. A year ago we furnished for planting them a large quantity, varying in size from two to ten feet. The smaller had been transplanted within two years. The larger were taken from an old and neglected plantation, without transplanting or culture for ten years. They all lived through the summer, and now, in the last of May, are fresh and healthy. At the same time, and also last fall, were planted large quantities of the American Arbor Vitæ, purchased by Mr. Stewart from different establishments. Among these the destruction from the past winter is so great that I incline to use the expression of the Florida planter, in response to my inquiry, after a hard frost, if his orange trees were killed: "Yes, *sir;* they are killed unanimously."

S. B. Parsons.

Fruit Culture.

The "Pinneo Pear."

BY WILLIAM H. YEOMANS.

WE agree most fully with what was said regarding the quality of this pear, called the Boston, in an article in the HORTICULTURIST for April, copied from the *Country Gentleman*, but, in behalf of the town of Columbia, and especially in the name of the originator of this pear, who long since passed from earth, do we protest against this effort of Mr. Hovey's to retain the honor of having disseminated that pear. It is a mystery, that, after the origin of the fruit had been satisfactorily proved, nearly twenty years ago, Mr. Hovey should still insist upon being the disseminator. Now that the real disseminator has long since been dead, it may to some be a matter of little consequence, but it is proper that the credit should remain permanent to the town of Columbia, in which Dea. Pinneo dwelt. If there is any honor in originating new and valuable fruits, then let that honor rest where it justly belongs. The brief description in the communication alluded to, is very far from a correct statement, as will be discovered.

Now, a few words of history: It is supposed that in the early part of the last century, Dea. James Pinneo settled upon the place in Columbia which long bore his name; the church records of Columbia show baptisms of that name from 1750 downwards. The records also show the following:

Dea. James Pinneo, died April 10, 1789, Æ 80 years.

Dea. James Pinneo, Esq., died June 14, 1824, Æ 90 years.

James Pinneo, Esq., died Jan. 14, 1838, Æ 72 years.

These represented three generations in the direct line, and all occupied the Pinneo place until about forty years ago, when the proprietorship changed, and no male descendants remained in town.

It is said that the elder Dea. Pinneo found a young pear tree growing wild in a piece of woodland, which he transplanted and cared for; in process of time this bore fruit, and of such good quality as to recommend it to the protection of Mr. Pinneo, and as an evidence not only of his faithfulness to the tree, but of the tree to him and his descendants, and the strangers that have dwelt in the land, it may be stated that the original tree still survives, and is at the distance of only about two miles from the writer; but the ravages of time have left their effects, and now it can only be said of the old tree, well done good and faithful servant.

But the valuable qualities of this fruit could not be concealed, and as a consequence there is hardly a farm in the whole town of Columbia but that has trees of this variety of pears upon it; not in great numbers, because in those early days fruits were not as highly prized as at the present day. Nor was its reputation confined to its parent town, it extended into adjoining towns; they were cultivated and kept for sale in a nursery that existed in town in the early part of the present century, and if the pear had no extended, outside reputation, it was no fault of the originator, nor of the pear, but for the want of a market; up to about 1840 there was no sale for pears at prices sufficiently remunerative to warrant the trouble of packing and marketing; at that time they could be exchanged in the Norwich and Hartford markets for groceries, at prices varying from fifty cents to one dollar per bushel.

The oldest inhabitants here have known of its being called the Pinneo pear during the whole period of their remembrance, which covers nearly all the time passed in the present century.

But it appears that the purchasers of this fruit were in the habit of shipping the same to Boston, where Mr. Hovey discovered it, and became so well satisfied as to its valuable qualities, as to secure some cions, by which means he obtained the fine rows named, which appear young indeed, in comparison with the many in this vicinity. In 1857, in reply to inquiries made by Dr. G. W. Russell, a pomologist, of Hartford, Mr. Thomas L. Brown, of whom he had grafts, wrote as follows:

"Last evening, I called on Dea. Hutchinson and obtained *definite* and *reliable* information of the origin of the Pinneo pear.

"More than fifty years ago, Dea. H. said that he went to Columbia on purpose to get of Dea. Pinneo some pear sprouts for himself. At that time Dea. Pinneo said to him (Dea. H.) that he was once mowing bushes on the out lot, and found a small pear tree, which he spared. In the proper time for setting trees, he dug it up and set it out near his dwelling, thinking to have it grafted some day, but concluded to let it grow as it was, and see what fruit it would bear. Well, it bore fruit which was good, and he did not wish it changed. Sprouts came up and were in turn set out, and bore the same kind of pears, and as the fruit became widely scattered, the fruit came by common consent to be called the Pinneo pear."

Nor is this all; at the seventh session of the American Pomological Society, held in the city of New York, in 1858, the question came up for discussion, during which Mr. Barry moved that the pear be called the Pinneo, which was carried, which fact was known by Mr. Hovey, who was present, who has, notwithstanding the same, persisted in calling the same the Boston.

It has been asserted as a principle, that "*No man has any right to name or re-name a fruit which he does not originate, unless with the knowledge, counsel and consent of all, or the majority of those who cultivate it, or with the concurrence of the nearest pomological society put in possession of the facts known concerning the origin and other names of the fruit.*"

This has not been done, nor will the numerous proprietors of the trees of this pear in this town, ever consent to being deprived of the name of Pinneo so long as they are allowed an expression.

And again, the pear was recognized by the Hartford County Horticultural Society by the name of Pinneo, as proved by the record, years before the name of Boston was recognized by the Massachusetts Horticultural Society.

Our excuse for thus trespassing upon your space is the desire that justice may be done and proper acknowledgment be given, by properly recognizing as the name of this pear, the name of him who saved it from the stroke of the scythe, and was the means of disseminating it in our community.

Columbia, Conn.

What of the Persimmon?

BY A. S. FULLER.

MUCH as pomology has been studied and practiced in this country, there are still many meritorious wild fruits which have received very little if any attention.

The fact of a fruit in its wild state possessing little merit, is not a sufficient reason for total neglect of attempts at improving it, for had this been the prevailing idea among our ancestors, we should probably have had nothing better than the ascerb crab pears, now found growing wild in the forests of Europe, and other fruits of like quality.

To even mention the persimmon among the wild fruits of our country deserving attention, may cause a smile upon the countenances of many persons who have never thought of or considered the merits which it actually possesses. In the first place the tree is one of the most beautiful in form of growth and foliage, besides being hardy, healthy, and adapted to a wide range of soil and climate. In fact, persimmon trees are worth cultivation for ornamental purposes, leaving the fruit out of the question. Generally the fruit of the persimmon is considered quite inferior, and as a rule, scarcely edible, until touched by frosts in autumn, still there are many wild varieties varying as widely as the wild plums, crab apples, and similar fruits, and among them really distinct and valuable sorts might be found. While the usual form of the fruit is globular, I have seen them oval, oblong, and in one instance oblong pointed, resembling very closely in size and shape Coe's golden drop plum. Then again, there are wild sorts which ripen long before frosts, as I know from personal acquaintance, and doubtless many other variations from normal types could be found if a close search was made in regions where this fruit abounds. Inferior in

quality as this fruit may be as usually found in its wild state, still it is naturally superior to the original of our choice sorts of the pear, or even apple. Now, from what has been done with the latter well-known fruits, we may judge of what could be done with the former. We should commence with the best sorts to be found, sowing the seed, giving high cultivation, and then selecting the best of these when their merits became known, after fruiting.

To hasten the period of fruiting, cions from the seedlings may be inserted into larger trees, kept expressly for this purpose, a system generally practiced by pomologists when raising pears and similar fruits from seed. Years of valuable time are thus saved by the use of large bearing trees for stocks, upon which to test the seedlings.

In addition to the chances of producing new and improved sorts of persimmons from seed, without any special effort on the part of the grower, we have now several exotic species of promise, with which our native one might be hybridized. A hybrid between the *Diospyrus Kaki*, of Japan, and our own *D. Virginiana*, would be a step in the right direction toward the production of distinct, if not valuable varieties.

The Japanese species succeeds in the Northern States, and the tree is a more rapid grower, and the fruit superior to ours, hence its value as one of the parents in producing hybrids.

The field is open, and the chances of producing a valuable fruit almost certain to the man who will take up the culture of the different species and varieties of persimmon, bestowing the same care and skill as in improving other kinds. Who will do it?

Notes from Michigan.

THE past winter has been the most severe experienced in Michigan for many years, and the damage to fruit trees of every kind, and also to vines and shrubs is very great. Peach trees have suffered severely, the damage not being confined to the buds but extending to a considerable part of the wood, in some places the trees are entirely destroyed. In some well sheltered orchards, some of the buds have escaped destruction, and a moderate crop of peaches is expected. Grape vines which were left on the trellises have lost a great part of their best wood. The Catawbas and Early Hartfords have suffered most, but the Concords and Delawares are also much damaged. Rogers' Hybrids, Iona, Isabella, etc. have generally been laid down and covered, and in common with all varieties that have been similarly protected, have probably received very little if any damage. Raspberries unprotected by a covering of some kind have been killed in exposed aspects.

Two singular instances of the accidental destruction of choice greenhouse plants occured in this city during the past winter. One was in the greenhouse of Mr. Sickler on High street West, which is heated by steam; in order to prevent rust he painted the pipes with gas-tar which when heated exhaled a destructive gas which killed the plants. The other occured in the greenhouse of Taplin & Davis on Twenty-fourth street and was caused by the bursting of a gas main, the gas from which entered a sewer which was connected with the greenhouse by tile drains. The gas issued from the joints of the tiles and became diffused through the greenhouses, and the result was the almost total destruction of seven thousand dollars worth of choice plants.

Detroit, Mich. EDWARD MASON.

The Cause of the Yellows.

THERE are some facts which I cannot reconcile with the theory that the yellows in peach trees is caused by the loss of the fibrous roots, the result of a fungus. Last season very thrifty trees, the second year from setting, bore diseased fruit, having all the symptoms of the yellows—purple discoloration of the flesh, premature ripening, and an unusually high colored exterior. The trees made shoots from two to three feet in length, which proves very conclusively, that they were not very deficient in fibrous roots.

Should these trees be allowed to stand, they will present a sickly appearance the coming season, and may then, on examination,

show diseased roots. This, with the facts above stated, would tend to prove that the loss of the fibrous roots is the effect and not the cause of this disease.

Another fact which is against this theory is that peach trees on plum roots have died with the yellows. If the disease has its origin in the roots, it would appear that plum roots are subject to the same malady. Then why do not plum *trees* have the yellows? Nor is the theory that the yellows is caused by exhaustion of the soil, any more satisfactory. People who plant their trees where, a year before, beech and maple forest trees were growing, have the disease to contend with. There may be a remedy yet discovered, but it is doubtful. Any persons who are under the impression that they have discovered one, are respectfully requested not to publish it until they have tested it at least three years, for while people are testing inefficient remedies, the disease is spreading. J. A. D.

St. Joseph, Mich.

Immediate effect of Cross Fertilization of Apples.

CHAS. W. GARFIELD, Agricultural College, Michigan, writes the *Country Gentleman* as follows: "We made ten crosses, employing ten specimens in each cross. Perfected fruit was attained in all but three instances. In only three did we observe any variation in the specimens save that which would come as an effect of the gauze employed to prevent the ravages of the coddling moth. These cases were as follows: 1st. Wagener upon Tallman Sweet. There was a modification of flavor quite noticeable, the fruit being sub-acid. 2d. Tallman Sweet upon Astrachan. In this instance there was a manifest change in color, flavor and shape. The apples were quite mild to the taste, the color was very much modified, and the form was that of a flat apple. 3d. Tallman Sweet upon Wagener. The modification here was noticeable in all the specimens, in flavor and color. Two of these had no gauze on them, and the difference was quite as noticeable in these samples as in the remainder.

The Western Triumph Blackberry.

THREE years ago we saw advertised in a Western paper, a new blackberry, under the above name, and we ordered a dozen plants which came duly to hand, with a modest bill for the same amounting to five dollars. The plants were set out, and made a vigorous growth, producing a fair quantity of fruit last year, which we thought was of very good flavor, but not up to the standard for size. The past winter was quite a severe one on all the small fruits, the blackberry not excepted, but our Western Triumph passed through uninjured, and was this season more heavily loaded with fruit than any other sort in our collection. The berries are also large, and so deliciously rich and sweet that to add sugar would be superfluous. The ladies of our household pronounce this new blackberry a "Triumph," especially the dyspeptic portion, who have to deny themselves the privilege of eating sugar upon fruits of all kinds. If our Western people can succeed as well with this variety as we have, there is no need of sending East for Kittatinny, Wilson and Lawton blackberry plants.—*Rural New Yorker.*

Dwarfs and Standards.—"To produce a dwarf cherry tree," says Mr. William Cobbett, which is desirable for some purposes and locations, the stock must come from the stone of the Morrello or a May Duke, a Black Heart, a White Heart, or a Bigarreau; but for a tall standard tree, select stock from the small black cherry tree that grows so universally in the woods." The practice of modern nurserymen, however, as described by Mr. A. J. Downing, is to bud the finer varieties on the seedlings of the common black Mazzard, which is a very common kind, producing a great abundance of fruit and very healthy, free-growing stock. Downing also recommends budding low down on young stock. For dwarfs Downing also says the Morrello seedlings are used, but standards are universally preferred.

Window Gardening.

Parlor Plants.

BY EDWARD S. RAND, JR. READ BEFORE MASSACHUSETTS HORTICULTURAL SOCIETY.

THE general love of flowers manifests itself most noticeably in the culture of window plants. Alike in the parlors of the rich and the garrets of the poor we see the love of these bright gifts of nature—often, indeed, in the latter case the only indictation of an appreciation of the beautiful. The window plants are cared for and tended, they share with the children of the family the mother's solicitude, but often from their general appearance one would judge that the care bestowed was ill requited. Yet the fault is not in the plants; they will well repay all care, but that care must be directed by intelligence.

A plant is an organized being; it lives, it breathes, eats, drinks, and digests; its term of life varies from a few summer days to hundreds of years; its wants are few, its food simple, and essentially the same in all the myriads of species, from the pole to the equator.

An important point to bear in mind is that these wants—these needs of the plant—few though they be, are imperative and unvarying. A man may neglect to take food, or he may over feed, and perchance escape ill effects, but the more delicate organism of the plant refuses over indulgence, and is sure to suffer from privation.

We are thus led to the statement that the reason of the general ill success of parlor culture of flowers is too great or too little care. In the first place, a plant is killed by kindness—by provision for fancied needs; in the other by neglect to supply the essentials of healthy life.

A third cause also is a choice of unsuitable species of plants, for the healthful existence of which we cannot in parlor culture supply the requisites. Let us now briefly consider the life of a plant as shown by the wants which are essential to that life.

We have said a plant lives and breathes, and a want of provision for this breathing is, we hold, one great cause of ill success in parlor culture. A plant breathes through myriads of pores existing more or less numerously in the foliage according to the species. If these pores become in any degree clogged by the fine dust of the room, just so much is the health of the plant affected by the stoppage of one of the vital functions. The dry air of living rooms, often contaminated by furnace gas or unconsumed illuminating gas, is another source of ill health.

Plants must breathe a moist, pure atmosphere—although what is a pure atmosphere for a plant is not so for animal life, as plants exhale oxygen and inhale carbonic acid, while exactly the converse is true of animals—and an atmosphere charged with coal gases is sure to produce disease.

The food of a plant is derived partly (sometimes wholly) from the air, in the form of moisture, and partly from the earth in the form of soluble salts; this food it elaborates by its own peculiar organism and appropriates to its growth, and just in the proportion that this food is furnished in suitable form and quantity for such adaptation, will be the healthy growth of the plant. Plants, too, have their seasons for feeding, and the supply of nutriment must not only be sufficient in quality and quantity, but furnished at the proper time.

Light, generally direct sunlight, is important to the health of plants; comparatively few thrive in shade, and with most the more light the stronger and more vigorous the growth. Plants grow to the light, and withdrawn from it they strive to reach it, and become what the gardeners call "drawn," that is, produce long, weak growth, with leaves at long intervals, instead of the short, stocky growth, which is in most plants a sign of health.

We thus have the essentials of health in the requisites of air, cleanliness, and light. These properly provided, with judicious watering and suitable soil, success is certain. Let us, however, consider these essentials somewhat in detail.

Air.—We have said a vitiated atmosphere is unsuitable for the healthy growth of plants,

and such is the air of most parlors and living rooms. Its life is dried out of it by its passing over the red hot iron of our furnaces and stoves. We can all remember instances where plants do well in rooms heated by open wood fires, the most healthy mode of heating a room, both for plants and human beings. Steam heat is better than that of furnaces or stoves, as the air is less contaminated, and can be kept moister. But it is not alone the dryness of the air that is injurious. From all furnaces or stoves more or less gases escape and contaminate the air, and where gas is used for illumination, a large percentage escapes unconsumed into the air of the room. Now, how can we remedy this? If possible, by growing our plants in rooms which are not lighted by gas or heated by furnaces or stoves. Where this is impossible, by securing by ventilation a complete change of the air of the room at least twice a day. Plants, especially those suited for parlor culture, seldom require a very high temperature, and most of our living rooms are too hot for them; a night temperature of 40°, rising to 65 or 70° by day, is quite sufficient for the healthy growth of most plants, and this rise of temperature should be mostly from sun heat.

Sudden changes of temperature, and cold drafts, should be avoided: to some plants a chill is almost as injurious as frost. During the present winter we have grown palms (*Latania*), agaves, *Cypripedium insigne*, *Tillandsias*, four species of ferns, Chinese primroses, and pelargoniums in a large entry where every cold night the mercury was as low as 42°, and more healthy plants one could not wish. A good plan is to separate a bow window from the room by a glass partition, making in fact a small conservatory, and thus pure air, moisture, and light can be secured. Evaporation of water on stoves or furnaces is of great benefit, and should be universally adopted; in fact the moister we can keep the air of the room, consistently with the health and comfort of the inmates, the better it will be for the plants; but let us remember that in a low temperature the moisture may be less than where the room is kept very warm.

Cleanliness is of the first importance. A dirty plant will not thrive. The fine dust always floating in the air of living rooms settles upon the plants. This is easily removed by sponging with lukewarm water, or by removing the plant to a sink and copiously showering it from the fine rose of a water-pot. The stem also of hard wooded plants should be occasionally sponged.

The frequency of showering or washing must be regulated by the necessities of the case or the nature of the plant. Some plants are impatient of water upon the foliage. In many cases dust may be removed by gentle brushing with a soft feather duster.

Under this head we may properly speak of the insects infesting house plants. These are few, and very little attention will keep plants clean.

Green fly, or aphis, which is the most common pest, is best destroyed by smoking. Place the infested plant under a barrel, put a few live coals in a dish, moisten some common plug tobacco that it may not blaze, throw it upon the coals, and let the plant remain in the fumes from five to ten minutes; then give the plant a good syringing or sprinkling, and the work is done.

Thrip seldom attacks house plants; should they be found, smoking will remove them. Red spider is kept down by moisture—frequent washing and sprinkling will destroy it.

Mealy bug is one of the worst pests of the greenhouse, but is rare on parlor plants. Washing will remove it, but the best plan is to touch the places where it is seen with a camel's hair pencil dipped in diluted alcohol.

Scale of several kinds is often found on the stems and leaves of parlor plants; washing with strong soapsuds and persistent application will remove it. A paragraph has been going the rounds of the papers recommending kerosene oil for scale on ivy; that it will destroy scale there is no doubt, but it will also kill the foliage. It might, however, be used cautiously if diluted with water, with which it will mix if a little soap is added.

A healthy plant is much less likely to be infested with insects, and if plants are kept in

stout, vigorous growth there will be little trouble from any insect pest. A warm, dry atmosphere is much more conducive to their development than a low, moist temperature. Generally, however, house plants have no insects which very little care when they first appear will not remove.

Light is very important to plants, and for most plants direct sunlight is necessary. A southerly window is the best exposure, but a deep bow window fronting the south, where the morning sun can come in on the east, and the light of the setting sun on the west, is the best for the growth of plants. If the choice is between an easterly or a westerly window, the easterly should have the preference, as the morning sun is better than the afternoon. The plants should be as close to the light as possible, as thereby there is less danger of their becoming drawn; they should be frequently turned, that all sides may have equal exposure; this is especially necessary with quick growing, soft wooded plants. Some of the revolving flower-stands are in this respect very useful, as they enable the plants to be turned to the light without the labor of lifting the pots. Light has also great influence upon the colors of flowers, which if grown away from the sun are usually pale and weak.

Water.—We have said that plants derive most of their food from the soluble salts of the soil which are taken up by the roots in a liquid form and assimilated to the uses of the plant. Sufficient and careful watering is most essential to successful culture, and it is from neglect in this particular that so many failures arise. The quantity of water needed varies with the nature of the plant; a very little suffices for some, others require a large supply. There are, however, very few plants that will flourish with water standing around the roots. Therefore, in potting, provision should be made by ample drainage for the escape of all superfluous water, and where saucers are used all water which drains off should be emptied. Watering may be more or less frequent according to the nature of the plant, but should always be thorough; not little driblets, given now and then, moistening the surface soil, and leaving the center of the ball dust dry, but a good soaking, thoroughly wetting all the soil until the water runs off; then do not water again until the plant is dry. The temperature of the water should never be below that of the air of the room; it may be higher, and the water may even be lukewarm; but the many paragraphs found in newspapers advising the use of hot water are no less pernicious than absurd. In a future paper treating of the best plants for parlor culture, we propose to prescribe more fully as to watering. The best mode of enriching the soil is in the water; guano, the salts of ammonia, and other manures may be applied in a soluble form; caution is necessary, however, lest the manure be too strong, thereby injuring the plant; and usually if the soil is good, no manure will be required. If a plant exhausts the soil, the best remedy is repotting.

Soil.—The soil in which the plant is grown is an important element of culture. For most house plants a rich, light soil is suitable, such as may be easily made by a slight mixture of fine sand with good garden loam. In this, if good drainage is secured, most plants will do well. Where, however, it can be obtained, a mixture of two parts well rotted turf and one part sharp sand is preferable.

If there is a neighboring greenhouse it is easy to obtain such soil, but any sweet earth which is not close, or by becoming so, allowed to get sour, will grow common plants well. The soil specially suited for particular plants will be prescribed when treating of those plants. It is a good plan to stir the surface of the soil in the pots whenever it becomes hard; this is especially beneficial to roses. The addition of a few bits of charcoal to the soil often increases the brilliancy of the flowers, and to some plants powdered bone imparts a more vigorous growth.

To conclude: while plants may live and often bloom with little care, and often in spite of neglect, they will repay well directed care by vigor of growth and profusion of bloom. While their wants are but few, attention to these is essential to their health; and in parlor culture of plants, if they are

worth growing at all, they are well worth the care which is necessary for successful culture.

In a future paper we propose to treat of the plants most suitable for house culture.

Plants in Rooms, are they Healthy or Injurious?

BY A. S. FULLER.

OUR chemists have frequently suggested, if not positively asserted, that plants in living rooms were not promotive of health.

The reciprocal action, known to be going on between the vegatable and animal kingdom, the first taking up and using carbonic acid gas, which is thrown off by the other, would seem to contradict the theories advanced in support of the oft repeated assertion that plants in rooms were injurious to health. If plants are the great purifiers of the atmosphere as admitted by our best chemists, why may they not perform their functions under all conditions when in a healthy growing state. It is said that every green portion of a plant absorbs carbonic acid gas, light decomposing this, the solid portions (carbon) being retained and the oxygen set free for the use of animals. If these chemical operations are of the nature and effect as stated, then plants in living rooms must make the atmosphere purer and better for the use of human beings, than it would be without them. This I believe to be a fact, and the modifications or exception to the general rule, must come under the head of plants exhaling noxious or powerful odors, at certain periods, as for instance when in bloom. The fragrance of the tuberose or Golden Japan lily is delightful to most persons, but to sleep or remain in an atmosphere overcharged with their perfume might prove to be anything but pleasant or healthful.

Then again the odors of flowers have different effect upon different persons, and those which exhilarate one, may depress another; besides, we are very prone to let our likes and dislikes come into play, affecting imagination which in turn becomes realization, the final result being a benefit or injury. Healthy plants do not vitiate the atmosphere, but sickly ones grown in the shade, or poorly ventilated rooms may; hence the importance of selecting for window culture those which are best adapted to the conditions to which they are to be subjected. But there is more danger from adverse consequences in not keeping any plants in our living rooms, than too many, for in addition to their purifying effect upon the atmosphere, they are promoters of cheerfulness which by long odds is the best of all preservers as well as restorers of health. If plants were as injurious to animals as sometimes asserted, the densely wooded regions of country could not be inhabited, but we know the contrary to be the case; hence all theories in regard to the unhealthiness of vegetation either by night or day, come to naught. Of course extremes in luxuriance and sterility must be considered as exceptions to a general rule.

There are no more healthy class of people than our florists, who spend the greater part of their lives in an atmosphere filled with the fragrance of flowers and exhalations of plants, and this to a portion of the year in the close and crowded greenhouses, where vitiated air would be found if anywhere.

On the whole, plants in rooms may be considered decidedly beneficial, especially during winter, when their purifying influence is needed far more than in summer; plants with large flowers and powerful odors may be avoided in rooms occupied by invalids, otherwise selections may be made to suit the taste of the cultivator.

House-Culture of Native Flowers.—A lady of Utica writes to *The Country Gentleman* as follows: "I am glad to find so many wild flowers recommended for the garden. In addition to those mentioned, we have been successful in raising the delicate *Tiarella* and *Mitella*. The leaves are exquisite during the whole season. *Trillium grandiflorum* is one of the finest plants I know for house-culture. When the flower expands it will keep a long time if set in a cool room out of the direct rays of the sun. The largest roots should be selected and treated as bulbs."

Editor's Portfolio.

How Horticulture is Taught in France.

The following (funny to us) notice appears in the French *Revue*, whose editor, M. Carriere, remarks:

"As in former years, our eminent confrere and fellow laborer, M. Verlot, at Grenoble, will give a public and free course of lectures on arboriculture."

Below will be found the notice of Monsieur the Mayor of the city of Grenoble:

"M. Verlott, gardener-in-chief of the city, gives notice that the course on arboriculture, specially applied to fruit trees, will commence on Sunday, the 17th of January, and will be continued up to Thursday, the 4th of March following. He will lecture on Sunday and Thursday of each week, at 11 o'clock in the morning, in one of the halls of the museum of the Jardin des Plantes. Some lessons will also be given every Sunday morning, at 8 o'clock, from the 25th of April to the 6th of June following. After *each theoretical lesson, practical demonstrations in relation thereto will take place*, in the fruit garden of the city."

American Potatoes in France.

M. Vilmorin, the well known seedsman of Paris, having given to Professor Lambin a large number of new vegetables for trial, he furnishes details of his experiences, and gives notice to the following kinds of American Potatoes:

Pomme de terre prolific de Bresee (Bresee's Prolific).—After describing the tuber, he says its taste recalls exactly the flavor of chestnuts. "Also, we don't hesitate to recommend it in a manner quite particular."

La Pomme de terre incomparable (The Peerless).—Very favorable report: "We ought not to hesitate to introduce it into both garden and field culture."

Rose hative (Early Rose).—"We come at last to the variety which has been so much spoken of since last spring. Its extreme vigor, with its abundant productiveness, which is the greatest with which we have ever met, will make it certainly the Queen of Irish potatoes, if the quality leaves nothing to be desired. It concludes by saying that the Early Rose is ten days later than a native kind, *La Marjolin*.

What a Mayor Knows about Potato Bugs.

Some time ago a Belgian official inquired of Mayor Brown, of St. Louis, to know if there was any real probability of the Colorado beetle being transported across the ocean, to become a pest in Europe. The following is an extract from the reply of Mayor Brown:

"Treating your letter, therefore, seriously, I have to state that there never has been a potato bug seen flying about St. Louis, or any other city in the United States or Territories; that the potato bug never has caused any alarm in any city nor in the country—only in certain seasons that seemed to be favorable to the production of them. I am not aware of the potato bug attacking any other vegetable. I consider the fears of the people of Belgium entirely groundless, even if the ravages of the potato bug had been great in any locality the past season, which it was not, and is a matter of no apprehension or comment at the present time in this country."

On receipt of this letter from the hands of H. de Boislieu, they immediately passed an act prohibiting the introduction of American potatoes.

Beecher on Apples.

Rev. Henry Ward Beecher expatiates with true ecclesiastical unction on the manifold uses of the apple in the domain of culinary art. It might take its place on the table as regularly as the potato or the onion, for though "the onion is far more odorous, the apple is far more blessed." It is an admirable sauce for meat, which always craves a piquant acid for relish. When meat is wanting, "a scrap of pork in the frying-pan, with sliced apples, will serve the economic table almost as well as if it had been carved from a beef or cut from a sheep." Mr. Beecher blesses the memory of the unknown inventor of the apple pie. He would fain make a pilgrimage to his grave and rear over it an everlasting mon-

ument. But the juice of the apple he accepts only with discreet reservations. Though banished from its former universal position upon the farmer's table, cider is creeping back again, but it comes in the name of a neighbor, and is called champagne. Whether in one form or another, it is still savory of the orchard; it still brings warmth to chilly veins, and adds to the cheer of many a homely domestic festival. "I cannot," says Mr. Beecher, "as a temperance man, exhort you to make it, but I must say, that if you make it you had better make it good."

Horticultural Hall — Centennial Exposition — Philadelphia, 1876.

We gave recently an illustration of one of the buildings of the great Centennial—the Horticultural Hall. The construction of this building has been provided for by an appropriation of the city of Philadelphia, and is to remain as a permanent ornament to Fairmount Park. The design is in the Mauresque style of architecture of the twelfth century. The principal materials used in construction are iron and glass. The length of the building is 383 feet, width 193 feet, and height to top of lantern 72 feet. The main floor is occupied by the central conservatory, 230 by 80 feet, 55 feet high, surmounted by a lantern 170 feet long by 20 feet wide. At a height of twenty feet from the floor a gallery, five feet wide, extends around the entire conservatory. Connected with the main conservatory will be forcing and propagating houses, refreshment rooms, etc.

Australian Timber Trees.

The Australian gum trees have for some time attracted attention in the United States, especially in California, where they are hardy. The *Queenslander* gives the following list and their values, which we reproduce for the benefit of readers in those localities where they will stand the winter:

The Gums: Blue (*Eucalyptus botryoides*)—Diameter, 30 to 48 inches; height, 70 to 150 feet. Wood used where hardness, toughness and durability are required, as for naves and felloes of wheels. The red and gray gums are much used for fencing, building and plow beams. The spotted gum is used by shipbuilders and wheelwrights.

Iron bark (*Eucalyptus siderophloia*)—Grows all over the open country; diameter, 20 to 30 inches; height, 60 to 80 feet; with a rough, furrowed bark. The hard timber makes good sleepers and bridges. The red mahogany, bloodwood, yellow box and turpentine trees are varieties of the Eucalyptus. The turpentine tree is hard, durable, and difficult to burn. The yellow box is very tough.

Black butt (*Eucalyptus pilularis*)—Grows on ridges; diameter, 24 to 40 inches; height, 60 to 80 feet. A valuable timber for building.

Stringy bark (*Eucalyptus fibrosa*)—Diamter, 18 to 24 inches; height, 40 to 60 feet. Timber much used for flooring and fencing, but inclined to shrink and warp. The Moreton Bay ash, one of the Eucalypti, has a brownish, hard wood. The bark of the lower part of the trunk splits into angular pieces, though elsewhere it falls in thin sheets.

Iron wood (*Heterodendron diversifolium*)—Grows in shrubs; diameter, 4 to 6 inches; height, 10 to 15 feet. Useful for pick handles, shafts, etc., from its toughness.

Tulip wood (*Harpullia pendula*—Diameter, 14 to 24 inches; height, 50 to 60 feet; Cabinet-makers admire it for its firmness, grain and fine markings.

Substitute for Rain.

M. Paraf has, to a certain extent, solved the problem of artificial irrigation, by the discovery of a method of doing without rain. His plan is to apply calcium chloride, which has a powerful affinity for moisture, and absorbs a large quantity from the atmosphere. From actual experiments he has found that it will produce irrigation more efficiently and cheaper than any other artificial method. One application will, he states, produce and retain abundant moisture for three days, when the same amount of water, applied in the ordinary way, would evaporate in an hour. The inventor believes that his way is cheaper than canal irrigation, and that not only by its use two blades of grass will be produced where only one is now, but that it will make it possi-

ble to have fields, meadows, grass and prosperity where now there is nothing but sand and desert waste.

Flowers in the Arctic Regions.

In a recent article on the flora of the Arctic regions the total number of species of flowering plants is given as 762, of which about fifty are exclusively confined to the Arctic regions. A very large proportion of these are found in Scandinavia, south of the Arctic circle, and reappear in the Alps; a few reach the Alpine regions of the mountains of India and Africa, and a few reappear in the extreme south of the southern hemisphere. In a less degree the same thing occurs from north to south on the American continent. Of these 762 species 616 have been observed in Arctic Europe, 233 in Arctic Asia, 364 in Arctic West America, 379 in Arctic East America, and 208 in Arctic Greenland. From the proportions the respective figures for the five different areas bear to the total, it will be seen that nearly all the areas must have a majority of species in common, and that each area has very few species peculiar to itself. In a broad sense, the Arctic vegetation closely resembles the flora of the higher Alps, but there is less brilliancy and variety of color in the flowers, yellow and white largely predominating. The plants assume a dense, tufted habit of growth, and increase mainly by lateral branches, which take root and in their turn produce offsets. It is possible that some or all of them ripen seeds in certain favorable seasons, but the almost total absence of annual plants and the habit of growth of the perennials seem to indicate that this very seldom happens. The four following plants, collected by Dr. Bessel in 82 degrees N. lat., but eight degrees from the North Pole, probably on the east side of Smith's Sound, represent the extreme northern limits of phanerogamic vegetation so far as at present known: *Draba alpina*, *Cerastium apinum*, *Taraxacum clens leonis* var., and *Pourlpina*. With the exception of the first these are also indigenous in Britain. Although there is what botanists term an Antarctic flora, not a single flowering plant has been found within the Antartic circle, and only a very limited number of the lower cryptogams.

The Florida Orange Crop.

From the report of the United States Inspector of Customs at New York we take the following items in regard to the production of oranges in Florida:

In Putnam county the product of the orange crop for the year 1874 was 1,000,000 —an increase of 300,000 over that of 1873. The number of acres in this county occupied by orange groves is 200.

From the best and most trustworthy information that can be obtained, it is believed the product of the orange crop of Florida the last year exceeds 20,000,000, and the increase of orange groves during the same time was at least 25 per cent.

The number of orange groves in the State may be fairly estimated at 1,000 groves, of 100 trees each on an average, besides many more containing from 200 to 7,000 each, and the number of bearing trees will exceed 50,000.

The largest portion of the orange crop of Florida goes to Savannah and Charleston, and from thence by rail to the interior, and by steamers to northern cities. Some portion finds its way to Nashville, Louisville, Cincinnati and other large cities, while steamships to Baltimore, Philadelphia and New York take a large part.

Fruit-Growing in Virginia.

At a meeting of the Virginia Horticultural Society, the past winter, a member said: "Let it be known abroad that the Albermarle pippins, grown in the Piedmont section, have attracted purchasers from New York, who have frequently paid $5 per barrel for them at the orchards; that the Lady apple, shipped from the Valley, has been sold at $20 per barrel in Philadelphia; that $15 per bushel has been obtained in New York for Bartlett pears grown in the tidewater section; that strawberries in the same district have not unfrequently produced the value of $600 to $800 per acre, and the Houghton gooseberry over $500 per acre.

Forests as Affecting Rainfall.

Upon this subject, which has been fruitful of much discussion and many learned dissertations, we find an interesting fact stated in an address on Modern Greece, delivered before the American Geographical Society by Hon. John M. Francis, lately United States Minister to that country. Mr. Francis states that at Athens, and throughout Attica, where hundreds of years ago the country was denuded of its forests, and where the mountains had been laid bare to the very rock from the abrasion of the elements, and the earth washed down into the valleys, almost obliterating the courses of the ancient rivers, the drouth of the hot season is continuous for a period of from four to five months, with scarcely a drop of rain to refresh the parched earth. But in other sections of Greece, as in portions of the Peloponnesus, the island of Eubea, and elsewhere within seventy-five and one hundred miles of the Capital, localities where forests have been preserved and are still carefully protected, no such drouth afflicts the land. The rain is distributed through the different seasons of the year, so that the moisture of the earth is retained and its fertility preserved. Mr. Francis believes this fact to be so important as to need no chemical analysis or scientific disquisition to enforce and illustrate its meaning, and that it demonstrates the utility of forests for the maintenance of an equilibrium of moisture throughout the different seasons of the year. May not our own people, who seemed to be possessed of a passion to practice the butchery of the forests, gather from this a lesson for their own good and the welfare of future generations?

Miscellaneous Plants.

Lapageria alba.—From James Comley were two splendid vases of Gloxinias, new Phlox—Mrs. Veitch—and *Lapageria alba. The Garden* of 1872 speaks of this plant as now being "a beautiful ornament in the conservatory at the Holme, Regent's Park. It is trained first on a trellis against the wall, and then across the house on a strong cord, about four feet from the roof and ten from the ground, the shoots being allowed to hang gracefully down. On the opposite side is a plant of the old or crimson kind, which meets and mingles with the shoots of the white one. The effect of the mixture of the variously colored flowers is, as readily may be supposed, very charming. Their beauty is not fully seen when the plants are trained stiffly against walls or trellises; the shoots should be allowed to hang down freely."

Begonias.—An interesting feature was the collection of new bulbous *Begonias* from James Comley, viz.: *B. Veitchii*, a magnificent species, of very neat growth, the flowers large and of a brilliant vermillion red, very distinct and beautiful; Lothair, deep rose, a fine flower; Gem, bright cream color, the reverse of the petals light pink; Corsair, rosy salmon; Magnet, beautiful light pink, the reverse of the petals deep pink; Mazeppa, very bright, cream color, the reverse of the petals tinged with orange pink. These belong to the handsome flowered, tuberous rooted section, and are very valuable acquisitions.

Retinispora filiforme pendula fol. var., a rare evergreen from Japan, exhibited by William Gray, Jr. This is the first plant that has been exhibited, and no other plant is known in the country. There was also a good display of bouquets, baskets of flowers and cut flowers by various contributors.

Agave schidigera, exhibited by Chas. S. Sargent, had a spike of flowers some six feet high. Curtis' *Botanical Magazine* says: "This remarkable plant was introduced into Europe from Mexico by M. Verschaffelt, of Ghent, in 1861; and as a species, M. Lemaire states that is so very closely allied to *A. filifera* that he was at first disposed to regard it as a variety of that plant." The specimen exhibited was a very handsome one, and is supposed to be the first that has flowered in this country.

Rare Shrubs.—Cut flowers of the following rare shrubs were shown by E. S. Rand, Jr: *Rhodotypus kerroides* and *Exochordia grandiflora;* also, Lilac, Dr. Lindley, the spikes of flowers very large, of a beautiful lav-

ender color, and delightfully fragrant; and Paul's new Scarlet Thorn. The *Gardener's Chronicle* says of the last that it is "much superior to any which had previously come under our notice, in the combined characters of depth of color and doubleness. The blossoms were fully double, and the color of a bright carmine red."

Beautiful Foliage Plant.—Joseph Clark again exhibited a very handsome table design, arranged in excellent taste, and E. S. Rand, Jr., *Tapeinotes Carolinia*. The following notice of this plant from *The Garden* for November, 1873, will be of interest to all: "This is one of the most beautiful of all stove flowering and foliage plants, and it deserves to be more generally cultivated than it is. It has also an interesting and melancholy history connected with it, having been discovered and named by the late Emperor Maximilian, an accomplished botanist, who, being struck by the beauty of the plant, named it in honor of his unfortunate consort, Empress Caroline. Its foliage is olive green above, slightly hairy, and shining as if varnished, while below the leaves are vivid purple. It flowers nearly all the year round, and bears blossoms of snowy whiteness, not unlike those of a Gloxinia in shape, but with the mouth curved upwards. It grows very freely in an ordinary plant stove, and delights in a fresh, open, peaty compost, and a humid atmosphere. When not in flower it is highly ornamental on account of its foliage, which has a metallic lustre not found in any gesneraceous plant with which we are acquainted.

Florida Cedar.

The superiority of the wood of the Florida cedar over all other kinds of cedar is well known, and the demand for it in Bavaria, where immense quantities of lead pencils are made, has induced some manufacturers to take up the question of the acclimatization of the tree in that country. Seeds have been sown in the royal forests, and about 5,000 young plants have been grown on one private estate. The cultivation of the tree has been attempted, also, in other parts of Germany.

Copal Tree.

Several seeds taken from the fruit of the copal tree of Zanzibar were planted in the Botanical Museum at Kew, England, where they are now represented by strong, healthy plants. Some of them are six or more inches high, and have six or seven pairs of leaflets. They are the first plants of the kind grown in Europe. Though there is always a steady demand for good copal in England, there can be no doubt that large quantities are still buried beneath African soil. In Loanda extensive deposits are known to exist, but, owing to a superstition among the natives, the resin is not allowed to be touched.

Action of Camphor on Plants.

Professor Vogel, of Munich, has lately published, says Gaglioni, some curious experiments on camphor and its physiological action on plants. In 1798 Benjamin Smith Barton first announced the stimulating action of camphor on vegetable organism. He stated that a tulip, with its stalk dipped in a solution of that substance, withered much later than others kept in common water, and that a yellow Iris that was about to fade was reinvigorated for a few hours by means of camphor. Barton, therefore, came to the conclusion that this drug acts upon plants as a stimulant, much as spirits do on the animal frame. These all but forgotten experiments have lately been resumed by Professor Vogel, who has lately communicated his results to the Academy of Munich. He first prepared a homogeneous solution of camphor, by triturating it with distilled water, and then shaking it up with a larger quantity of the same, and into this he put his plants. Two branches of Syringa (common Silac) in blossom, of equal size and vigor, were selected; one of them was put into common water, the other into the camphorated solution. A remarkable difference was soon noticed. After the lapse of twelve hours the former was already drooping and nearly faded, while the latter was still erect, and apparently as fresh as ever, some of its buds having been opened in the interval, and this healthy condition lasted three days. In another experiment, a bunch

of Lilacs which was nearly dead was put into camphorated water, and revived for a short time. The action of camphor is less powerful on the vine, and scarcely of any effect on the black Alder. The idea now presented itself that this drug might also have action on seeds, and accordingly some of *Sepidium satirum*, or Garden Cress, were subjected to this treatment. They were chosen very old, because in that state their germinating power is much weaker than when they are new. The seeds were placed on blotting paper, in porcelain platters, one portion being wetted with the camphor solution, and another with common water; another piece of blotting paper was laid over each. The germinating power of these seeds is considered not to extend beyond three years, and yet, under the influence of camphor, some of 1869 germinated in the course of twenty-four hours; the others, of 1871, in seven hours; while those exposed to the action of pure water either did not give signs of life, or, at least, very imperfectly. From these and similar experiments it may be concluded that camphor is a valuable agent in horticulture.—*Journal of Horticulture.*

Growth Force in Plants.

A correspondent of the *Country Gentleman* has the following interesting note on growth force in plants:

"Those who have never given the matter much attention, will be surprised at the force which growing plants exert. At a recent meeting at the Academy of Natural Sciences in Philadelphia, Mr. Thomas Meehan exhibited a root of the common Pæony with a stolon of common couch-grass (*Triticum repens*) growing through it from one side to the other. He also stated that he had found potatoes with the stolons of grass growing through them in the same manner. A short time ago, while inspecting a fine asphaltic drive, I noticed that within a diamater of four or five feet there were several spots where repairs had recently been made, and on inquiry as to the cause, was informed that after the drive became hard enough to use, these spots were observed to rise up, and continued to do so until the raised part burst open. On making repairs it was found that the trouble was caused by a few roots of the common plantain, which had not been removed when the asphalt was laid down. As the pavement was hard, and several inches thick, the steady force of growth must have been very great. Near by, a large slate slab, four feet by six, was observed to rise steadily at one end without any corresponding depression at the other. Examination showed a root of plantain growing under the raised end, and supporting the whole weight of the stone.

Captain Henry Simonds, proprietor of the extensive trout ponds in Westport, sends one hundred pounds of trout every week to Willard's Hotel, Washington, and receives the handsome little sum of one hundred and seventy-five dollars in return.

Col. Edward Wilkins, of Kent county, Md., has planted an orchard of fifteen thousand peach trees, all of one variety—the Early Beatrice.

Russia's most fiery demand is for coal. Her product does not exceed 100,000 tons per annum, and this quantity is obtained entirely from one source, which is likely to become exhausted in a very few years.

A New Architectural Book.

A valuable addition to our standard American works on architecture has been made by A. J. Bicknell & Co. of this city, in the publication of a new work, entitled "*Wooden and Brick Buildings, with Details.*"

The work is published in two volumes, and contains full page plates of 160 designs of villas, cottages, stone dwellings and city buildings, of very superior style of art. Designs vary in cost from $1,000 upward, and many of them are very elaborate. Contributions from no less than forty-four architects appear in its pages, and from this can be formed a good opinion of the great variety of designs illustrated. It is a model volume, and the best yet issued by the firm. Bound in superb style. Price, $18.